

**UNITED STATES DISTRICT COURT
DISTRICT OF NEVADA**

Signify North America Corporation, et al.,

Case No.: 2:22-cv-02095-JAD-DJA

Plaintiffs

Lepro Innovation Inc., et al.,

Defendants

Claim-Construction Order

[ECF No. 54]

This is a patent-infringement suit over LED lighting products. Plaintiffs Signify North America Corporation and Signify Holding B.V. (collectively, “Signify”) allege that defendants Innovation Inc., LE Innovation Inc., Innovation Rules Inc., Home Ever Inc., and Lepro lighting Inc. (collectively, “Lepro”) infringed seven of Signify’s patents covering various technologies. In addition to disagreeing about how several of the patents’ terms should be construed, the parties dispute whether the terms “controller,” “adjustment circuit,” and “power supply” as used in two of the patents are means-plus-function terms subject to 35 U.S.C. § 112(f), and whether the term “background noise” as used in one of the patents is indefinite.

17 Having reviewed the parties' extensive claim-construction briefs and after a full-day *Markman*
18 hearing, I construe some terms that need construction; conclude several others need no
19 construction; hold that the term "background noise" is not indefinite; and find that the terms
20 "controller," "adjustment circuit," and "power circuitry" are not means-plus-function terms.

Discussion

2 | I. U.S. Patent No. 7,014,336

A. Overview

The '336 patent is titled "Systems and Methods for Generating and Modulating Illumination Conditions," and one aspect of the invention is directed towards using LEDs to generate "high-quality white light."¹ According to the patent, this can be accomplished "by mixing the electromagnetic radiation from a plurality of component illumination sources such as LEDs" and, more specifically, "by choosing LEDs that provide a white light that is targeted to the human eye's interpretation of light"² or "photopic response."³ The patent explains that "traditional mixing methods" used to create white light "still produce an abnormal appearance to the human eye."⁴ This "artificial" appearance is due in part to "dramatic peaks" or "spikes" in the electromagnetic (light) spectrum.⁵ Indeed, "part of the reason that fluorescent light looks very artificial" is because of such peaks.⁶

14 The patent goes on to note that “most artificial light” has “some peaks and valleys” that
15 fall “within the area of the human eye’s photopic response.”⁷ But to create “high-quality white
16 light” (according to at least one embodiment) it is “desirable to close the gap between the lowest

¹ See '336 Patent, 20:6–20.

² *Id.* at 20:10-14.

³ *Id.* at 20:32–36.

⁴ *Id.* at 21:34–37.

⁵ *Id.* at 21:50-67.

6 *Id*

⁷ *Id.* at 16:23.

1 valley and the maximum peak,”⁸ and “the less difference between those two points the better.”⁹
 2 Moreover, “[t]he lowest valley in the visible range should have a greater intensity than the
 3 intensity attributable to background noise as would be understood by one of skill in the art.”¹⁰

4 **B. “Background noise”**

5 Signify’s Proposed Construction	6 Lepro’s Proposed Construction	7 Court’s Construction
8 Plain and ordinary meaning (If construction required: “electromagnetic radiation produced independent of the lighting fixture”)	9 Indefinite	10 “electromagnetic radiation produced independent of the lighting fixture”

11 Signify contends that the term “background noise” should be given its plain and ordinary
 12 meaning but, if construction is required, it should be construed as “electromagnetic radiation
 13 produced independent of the lighting fixture.”¹¹ Lepro argues that this term is indefinite.¹² A
 14 claim is indefinite if, when read in the context of the specification and prosecution history, it fails
 15 “to inform those skilled in the art about the scope of invention with reasonable certainty.”¹³
 16 “Indefiniteness must be proven by clear and convincing evidence.”¹⁴ For several reasons, Lepro
 17 has not met its burden of demonstrating by clear and convincing evidence that the term
 18 “background noise” is indefinite.

19⁸ *Id.* at 22:34–36.

20⁹ *Id.* at 22:21–22.

21¹⁰ *Id.* at 22:32–35.

22¹¹ ECF No. 54 at 15.

23¹² ECF No. 60 at 6.

¹³ *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 910 (2014).

¹⁴ *Sonix Tech. Co. v. Publ’ns Int’l, Ltd.*, 844 F.3d 1370, 1377 (Fed. Cir. 2017) (citing *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 789 F.3d 1335, 1345 (Fed. Cir. 2015)).

1 Lepro first characterizes as “unfounded,” “conclusory,” and “without objective support”
 2 Signify’s statements that this is a common term that a person of ordinary skill in the art
 3 (POSITA) would have understood.¹⁵ But the ’336 patent itself explicitly states that this term has
 4 a meaning that would have been understood by a POSITA at the time of invention.¹⁶ Lepro
 5 offers nothing to rebut this intrinsic evidence other than attorney argument via a single footnote
 6 characterizing this as a “passing, self-serving statement.”¹⁷ But “attorney argument is generally
 7 insufficient to demonstrate invalidity,”¹⁸ and this statement from the patent does, at minimum,
 8 indicate that “background noise” has a meaning in the context of the ’336 patent that a POSITA
 9 would have understood at the time of invention.

10 But the patent doesn’t define “background noise,” so Signify offers a definition from an
 11 electrical-engineering dictionary: “the noise that typically affects a system but is produced
 12 independent of the system.”¹⁹ Lepro argues that this definition is “irrelevant” and only concerns
 13 other fields.²⁰ While certain latter parts of the definition do explain its specific meaning in
 14 distinct fields, its main definition of “background noise” appears to be generally consistent with
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16¹⁵ ECF No. 60 at 8.

17¹⁶ ’336 Patent, 22:32–35.

18¹⁷ ECF No. 60 at 8 n.9.

19¹⁸ *SunPower Corp. v. PanelClaw, Inc.*, 2016 WL 4578324, at *5 (D. Del. Aug. 31, 2016)
 (collecting cases); see also *Mallinckrodt, Inc. v. Masimo Corp.*, 147 F. App’x 158, 179 (Fed. Cir.
 2005); *Wirtgen Am., Inc. v. Caterpillar, Inc.*, 2023 WL 2456090, at *5 (D. Del. Mar. 10, 2023).

20¹⁹ ECF No. 54. at 16 (citing ECF No. 54-8). This dictionary defines “background noise” as “the
 noise that typically affects a system but is produced independent of the system. This noise is
 typically due to thermal effects in materials, interpreted as the random motion of electrons, and
 the intensity depends on the temperature of the material. In radio channels, background noise is
 typically due to radiation that is inherent to the universe and due mainly to radiation from
 astronomical bodies. There is a fundamental lower bound to the intensity of such noise [that] is
 solely dependent on the universe and independent of antenna and receiver design”).

²⁰ ECF No. 60 at 8.

1 the usage of this term in the '336 patent and Signify's proposed construction; so it further
 2 supports Signify's position that a POSITA would have understood this term's meaning when
 3 viewing it in context of the claim language and specification.²¹ Still, this definition is quite
 4 broad, and Signify (via its proposed construction) has contended that a POSITA would
 5 understand the term as used here to have a meaning more narrowly tailored to the context of the
 6 '336 patent. This proposed construction is consistent with the dictionary definition²² and the
 7 term's use in the '336 patent,²³ and Lepro hasn't shown that a POSITA would understand it to
 8 mean something else.

9 Lepro has, however, argued that even this proposed construction is indefinite. Lepro first
 10 notes that the proposed definition "doesn't explain how background noise is measured."²⁴ But it
 11 doesn't appear that measuring electromagnetic radiation was a novel concept that would be
 12 unfamiliar to a POSITA at the time of invention; indeed, the patent describes and depicts
 13 electromagnetic-radiation measurements for various exemplary lighting fixtures.²⁵ Lepro next
 14 contends that this proposed definition is indefinite because it doesn't explain "what the source of
 15 the 'electromagnetic radiation' is to take measurement from," noting that "background noise"
 16 would vary "depending on the lighting conditions in the environment surrounding the 'lighting
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19²¹ ECF No. 54-8 at 4.

20²² The dictionary also notes that in the context of "radio channels" the background noise is
 21 "typically due to radiation." ECF No. 54-8 at 4. The fact that the definition references
 22 "radiation" generally, rather than electromagnetic radiation specifically, and doesn't specifically
 23 refer to lighting fixtures, doesn't negate this definition's value if only as a reference point to
 24 extrapolate this term's specific meaning as it is used the '336 patent.

²³ See, e.g., '336 Patent, 5:13–28.

²⁴ ECF No. 60 at 9.

²⁵ See, e.g., '336 Patent, Figs. 14–17, 22:60–24:17.

1 fixture.”²⁶ But the fact that “background noise” is not a constant doesn’t make it immeasurable.
 2 And even if it does mean that infringement can only be determined after the lighting fixture is
 3 used in a particular environment, that is not grounds for finding the term indefinite.²⁷

4 Signify’s proposed construction is consistent with both intrinsic and extrinsic evidence,
 5 and Lepro hasn’t demonstrated by clear and convincing evidence that the term “background
 6 noise” or Signify’s proposed definition are indefinite. So I construe the term “background noise”
 7 to mean “electromagnetic radiation produced independent of the lighting fixture.”

8 **II. U.S. Patent Nos. 7,038,399 and 7,352,138**

9 **A. Overview**

10 The ’138 patent is a continuation of the ’399 patent²⁸ and they share the same
 11 specification.²⁹ These patents relate to “methods and apparatus for providing power to devices
 12 on A.C. power circuits” and in particular concern using “light emitting diode (LED) based
 13 devices”³⁰ with traditional A.C. power circuits controlled by conventional dimmers.³¹ The
 14 patent teaches that LED-based light sources are generally “incompatible with dimmer circuits

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 17²⁶ ECF No. 60 at 9.

18²⁷ *Nevro Corp. v. Bos. Sci. Corp.*, 955 F.3d 35, 40 (Fed. Cir. 2020) (“Definiteness does not
 19 require that a potential infringer be able to determine *ex ante* if a particular act infringes the
 20 claims.”). Lepro similarly argues that “background noise” is indefinite because the intensity of
 21 permissible background noise can vary based on the intensity of the light’s lowest spectral
 22 valley. ECF No. 60 at 10. This too suggests that infringement could only be determined after a
 23 lighting fixture was used in a particular environment, but that likewise doesn’t render the term
 24 indefinite.

²⁵ ’138 Patent, 1:8–13.

²⁶ ECF No. 54 at 17; ECF No. 60 at 10.

²⁷ ’138 Patent, 1:33–37.

²⁸ *Id.* at 9:4–22.

1 that provide A.C. output signals” as they operate “based on substantially D.C. power sources,”³²
 2 and thus do not brighten or dim like incandescent lights would in response to the “chopped” or
 3 non-standard A.C. signals produced by traditional A.C. dimmer circuits.³³ This, of course,
 4 “impedes convenient substitution of LED-based light sources into pre-existing lighting systems
 5 in which conventional light sources are operated via A.C. dimmer circuits.”³⁴ In order to make
 6 LEDs compatible with signals from A.C. dimmer circuits, the patents disclose a “controller” to
 7 convert A.C. signal into a D.C. signal that can provide power to an LED-based light source.³⁵ In
 8 some embodiments, the “controller” is comprised of “power circuitry” that “provides an
 9 essentially stable D.C. voltage as a power supply for the LED-based light source.”³⁶ The
 10 controller may also include an “adjustment circuit” that varies the light output of the LED in
 11 response to a user operating the traditional A.C. dimmer.³⁷

12 B. Applicable law

13 Lepro contends that three terms from the ’399 and ’138 patents—controller, power
 14 circuitry, and adjustment circuit—are “means-plus-function” terms under 35 U.S.C. § 112(f).
 15 That section gives patentees the option of drafting a patent using functional terms (what the
 16 claimed invention does) instead of implementation terms (how the claimed function operates).³⁸
 17 Congress enacted § 112(f) to empower patentees to use functional claiming if they can ensure
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19 ³² *Id.* at 9:15–19.

20 ³³ See *id.* at 2:38–54.

21 ³⁴ *Id.* at 9:20–22.

22 ³⁵ *Id.* at 10:49–53.

23 ³⁶ See *id.* at 12:64–13:2 (cleaned up).

24 ³⁷ *Id.* at 14:4–22.

25 ³⁸ See 35 U.S.C. § 112(f).

1 that the public knows how that function can be accomplished.³⁹ So when a patentee uses
 2 functional language in a patent, he must also disclose in the specification what structure, or
 3 which devices, can be used to carry out the function. Analysis under § 112(f) involves a two-
 4 step process: (1) the court decides whether a term is functional; if it is, then (2) the court must
 5 determine if the patentee has satisfied § 112(f) by sufficiently describing “the structure, material,
 6 or acts” to perform the function.⁴⁰ If a patentee uses a functional term without sufficiently
 7 disclosing the structure, the term is indefinite and cannot be enforced in an infringement action.⁴¹

8 The first step of the § 112(f) analysis is informed by one of two presumptions. If the
 9 claim language includes the word “means” the court starts with the presumption that it is a
 10 functional term and that § 112(f) applies.⁴² But when, like here, the term “means” is not in the
 11 claim language, the court presumes that the term is not functional and that § 112(f)’s
 12 requirements do not apply.⁴³ From 2004 to 2015, the presumption “flowing from the absence of
 13 the word ‘means’ [was] a strong one that [was] not readily overcome.”⁴⁴ But in *Williamson v.*
 14 *Citrix Online*, the Federal Circuit held that this “heightened burden is unjustified” and that there
 15 is no reason to “characteriz[e] [] that presumption as ‘strong.’”⁴⁵ So courts now must simply ask
 16 whether “the words of the claim are understood by persons of ordinary skill in the art to have a

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 18 ³⁹ See Brad A. Schepers, *Interpretation of Patent Process Claims in Light of the Narrowing*
 19 *Effect of 35 U.S.C. § 112(6)*, Ind. L. Rev. 1133, 1134, 1139–40 (1998).

20 ⁴⁰ 35 U.S.C. § 112(f).

21 ⁴¹ *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1352 (Fed. Cir. 2015).

22 ⁴² *Id.* at 1349.

23 ⁴³ *Id.*

24 ⁴⁴ *Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382 F.3d 1354, 1358 (Fed. Cir. 2004);
 25 *Williamson*, 792 F.3d at 1348.

26 ⁴⁵ *Williamson*, 792 F.3d at 1349.

1 sufficiently definite meaning as the name for structure.”⁴⁶ And “[w]hen the claim term lacks the
 2 word ‘means,’ the presumption can be overcome . . . if the challenger demonstrates that the claim
 3 term fails to ‘recite sufficiently definite structure’ or else recites ‘function without reciting
 4 sufficient structure for performing that function.’”⁴⁷ “In determining whether this presumption
 5 has been rebutted, the challenger must establish by a preponderance of the evidence” that
 6 § 112(f) applies.⁴⁸

7 During the *Markman* hearing, there was some disagreement about the correct standard for
 8 rebutting this presumption stemming from defense counsel’s breakdown of the second part of the
 9 standard for rebutting this presumption that is summarized in *Williamson*.⁴⁹ Lepro’s counsel
 10 argued that this required (1) identifying the function and (2) determining whether the *claim*
 11 recites sufficient structure for performing said function, which is generally consistent with the
 12 language in *Williamson*. But Lepro’s breakdown of this language is structurally similar to the
 13 two-step analysis courts perform *after* determining that § 112(f) does apply, which requires
 14 (1) “identify[ing] the claimed function”⁵⁰ and then (2) “ascertain[ing] the corresponding
 15 structures *in the written description* that perform [that] function[].”⁵¹ The second steps are
 16 different, but it seems that the identical first steps and structural similarity led Signify’s counsel
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18⁴⁶ *Id.*

19⁴⁷ *Id.* (citing *Watts v. XL Sys., Inc.*, 232 F.3d 877, 880 (Fed. Cir. 2000)).

20⁴⁸ *Advanced Ground Info. Sys., Inc. v. Life360, Inc.*, 830 F.3d 1341, 1347 (Fed. Cir. 2016) (citing
Apex Inc. v. Raritan Comput. Inc., 325 F.3d 1364, 1372 (Fed. Cir. 2003)).

21⁴⁹ *Id.* (citing *Watts*, 232 F.3d at 880) (“When the claim term lacks the word ‘means,’ the
 presumption can be overcome . . . if the challenger demonstrates that the claim term . . . recites
 ‘function without reciting sufficient structure for performing that function.’”).

22⁵⁰ *Omega Eng’g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1321 (Fed. Cir. 2003) (citing *Cardiac
 Pacemakers, Inc. v. St. Jude Med., Inc.*, 296 F.3d 1106, 1113 (Fed. Cir. 2002)) (internal citation
 23 omitted).

⁵¹ *Id.* (citing *Cardiac Pacemakers*, 296 F.3d at 113) (emphasis added).

1 to believe that Lepro's counsel was attempting to skip past determining whether § 112(f) applied
 2 in the first place.⁵²

3 Regardless of the source of this disagreement, *Williamson* and the Federal Circuit
 4 decisions following and interpreting it are clear: “a claim term is subject to § 112(f) if it recites
 5 ‘function without reciting sufficient structure *for performing that function.*’”⁵³ So “[t]he
 6 question is not whether a claim term recites *any* structure” or “is utterly devoid of structure,” but
 7 “whether it recites *sufficient* structure” to perform the claimed function.⁵⁴

8 **C. “Controller”**

Signify's Proposed Construction	Lepro's Proposed Construction	Court's Construction
Plain and ordinary meaning; (If construction required: “A circuit or component that controls”)	Means-plus-function term	Plain and ordinary meaning

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 13 Lepro argues that the term “controller” in the ’399 and ’138 patents is a means-plus-
 14 function term subject to § 112(f).⁵⁵ Signify counters that a POSITA would understand this term
 15 to connote structure and that it should be afforded its plain and ordinary meaning.⁵⁶

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 17 ⁵² When arguing that Lepro's counsel was not applying the correct standard, Signify's counsel referenced *VDPP LLC v. Vizio, Inc.*, 2022 WL 885771, at *3 (Fed. Cir. Mar. 25, 2022). But the portion of *Vizio* that Signify's counsel highlighted merely clarified that “[w]hether the specifications disclose adequate corresponding structures for the claimed functions is a question we review at step two of the § 112(f) analysis.” *Id.* (emphasis added).

20 ⁵³ *Egenera, Inc. v. Cisco Sys., Inc.*, 972 F.3d 1367, 1374 (Fed. Cir. 2020) (quoting *Williamson*, 792 F.3d at 1348).

21 ⁵⁴ *Id.*; see also *XR Commc'nns, LLC v. ARRIS Sols., Inc.*, 2023 WL 3529830, at *3 (Fed. Cir. May 18, 2023) (noting that § 112(f) is not avoided by “reciting something a POSITA would understand as structure . . . if a POSITA wouldn't understand it as sufficient structure *for performing the claimed function*”).

23 ⁵⁵ ECF No. 60 at 12.

26 ⁵⁶ ECF No. 54 at 20.

1 ***I. The specification doesn't define "controller."***

2 Lepro contends that § 112(f) applies because “[t]he specification expressly defines
 3 ‘controller’ in broad functional terms as ‘various apparatus relating to the operation of one or
 4 more light sources.’”⁵⁷ “[W]ords of a claim are generally given their ordinary and customary
 5 meaning as understood by a person of ordinary skill in the art when read in the context of the
 6 specification and prosecution history.”⁵⁸ One of the exceptions to this general rule is “when the
 7 patentee sets out a definition and acts as his own lexicographer.”⁵⁹ But the “standard[] for
 8 finding lexicography” is “exacting.”⁶⁰ “To act as its own lexicographer, a patentee must ‘clearly
 9 set forth a definition of the disputed claim term’ and ‘clearly express an intent to define the
 10 term.’”⁶¹ And “[t]he patentee’s lexicography must, of course, appear *with reasonable clarity,*
 11 *deliberateness, and precision* before it can affect the claim.”⁶²

12 The paragraph at issue, excerpted below, is undoubtedly broad:

13 The terms “processor” or “controller” are used herein
 14 interchangeably to describe various apparatus relating to the
 15 operation of one or more light sources. A processor or controller
 16 can be implemented in numerous ways, such as with dedicated
 17 hardware, using one or more microprocessors that are programmed
 18 using software (e.g., microcode) to perform various functions
 19 discussed herein, or as a combination of dedicated hardware to
 20 perform some functions and programmed microprocessors and
 21 associated circuitry to perform other functions.⁶³

19⁵⁷ ECF No. 60 at 15.

20⁵⁸ *Thorner v. Sony Comput. Ent. Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012) (citing *Phillips*
 21 *v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005)).

22⁵⁹ *Id.* (citing *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1580 (Fed. Cir. 1996)).

23⁶⁰ *GE Lighting Sols., LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014).

⁶¹ *Id.* (quoting *Thorner*, 669 F.3d at 1365) (cleaned up)

⁶² *Abbott Lab'ys v. Syntron Bioresearch, Inc.*, 334 F.3d 1343, 1354 (Fed. Cir. 2003) (cleaned up).

⁶³ '399 Patent, 6:19–28.

1 Lepro contends that the “are used herein” phrase “invokes the ‘own lexicographer law’
 2 and provides a binding definition.”⁶⁴ Use of the phrase “as used herein” or variations thereof can
 3 express an intent to define.⁶⁵ But the language that follows that phrase here lacks the clarity and
 4 precision necessary to make any attempt to define effective. The first sentence of the paragraph
 5 notes that “processor” and “controller” are “used to describe various apparatus.”⁶⁶ But
 6 “apparatus” has a much broader meaning than “controller” or “processor” and is a widely
 7 recognized nonce word, and the remainder of that sentence does almost nothing to narrow the
 8 term’s meaning in the context of a patent centered on powering LED-based light sources. So
 9 even if the patentee intended to define “controller” as “various apparatus relating to the operation
 10 of one or more light sources,” this phrase lacks the precision and reasonable clarity required for
 11 it to serve as the definition of a claim term.

12 The specification then arguably goes on to narrow what a “controller” could be by noting
 13 that this term could refer to any of three distinct types or combinations of structures: dedicated
 14 hardware, one or more microprocessors, or a combination of dedicated hardware and
 15 microprocessors.⁶⁷ But having multiple “alternative definitions for the term at issue” likewise
 16 fails to “provide reasonable clarity, deliberateness, and precision.”⁶⁸ So the specification

20 ⁶⁴ ECF No. 60 at 15.

21 ⁶⁵ *E.g., Chemtall, Inc. v. United States*, 878 F.3d 1012, 1023 (Fed. Cir. 2017); *Medicines Co. v. Mylan, Inc.*, 853 F.3d 1296, 1300, 1307 (Fed. Cir. 2017).

22 ⁶⁶ ’399 Patent, 6:19–21.

23 ⁶⁷ ’399 Patent, 6:21–28.

⁶⁸ *Abbot Lab’ys*, 334 F.3d at 1355.

1 language Lepro relies on “does not define the claim term in a manner required under” Federal
 2 Circuit precedent.⁶⁹

3 2. ***Lepro fails to rebut the presumption that § 112(f) doesn’t apply to***
 4 ***“controller.”***

5 Lepro argues that “controller” as used in asserted claims from the ’399 and ’138 patents⁷⁰
 6 “is no more than a ‘black box recitation of structure’ that is simply a generic substitute for
 7 ‘means.’”⁷¹ Signify counters that “controller” “is a common term that would have been readily
 8 understood by a” POSITA “at the time of invention.”⁷²

9 Signify cites to definitions from two-electrical engineering dictionaries in support of its
 10 position that “controller” is a common term that a POSITA would understand as structural.⁷³
 11 Lepro responds that these dictionary definitions show that “controller” and “control circuit” are
 12 terms “that can mean different things in different contexts” and cites to another technical
 13 dictionary that also contains multiple definitions for the term.⁷⁴ But, as Signify highlights, all the
 14 definitions are generally consistent with one another and reflect a class of structures attributable
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17 ⁶⁹*Id.* “Processor” and “controller” are also *not* used interchangeably throughout the
 18 specifications and claims, which only further demonstrates this purported defining paragraph’s
 19 lack of clarity and precision. *Compare* ’399 Patent, 12:25–14:52 (discussing controllers that do
 20 not have processors) *with id.* at 14:53–22:52 (discussing processor-based controllers).

21 ⁷⁰ The parties dispute the construction of the term “controller” in claims 7, 8, 17, 58, 59, and 60
 22 of the ’399 patent and claims 1, 9–11, and 20 of the ’138 patent. *See* ECF No. 48-1 at 3–12, 19–
 23 26.

24 ⁷¹ ECF No. 60 at 15 (citing *Egenera*, 972 F.3d at 1375). Since I have found that the specification
 25 doesn’t define “controller,” Lepro’s argument that this term is a nonce word because any
 26 structural meaning “has been negated by the specification’s express definition” fails. *Id.* at 16.

27 ⁷² ECF No. 54 at 20.

28 ⁷³ *Id.* at 22.

29 ⁷⁴ ECF No. 60 at 16.

1 to the term “controller.”⁷⁵ The dictionaries also all contain at least one definition consistent with
 2 the term’s use in the ’399 and ’138 patents.⁷⁶ And a POSITA wouldn’t be viewing this term in
 3 the abstract; she would be viewing it in the context of these patents’ claims and specifications.⁷⁷

4 The specification also supports Signify’s position that a POSITA would understand
 5 “controller” to be a structural term here. It contains multiple, detailed examples of different
 6 types of circuits⁷⁸ or combinations of circuitry and microprocessors⁷⁹ that serve as controllers,
 7 and the Federal Circuit has long recognized that POSITAs understand circuits, even in the
 8 abstract, as connoting some structure.⁸⁰ The claims themselves also provide further structural
 9 limitations. Even the claims that provide the least amount of detail about the controller recite its
 10 objectives and outputs.⁸¹ Such “contextual language” when dealing with circuits or circuitry

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 13 ⁷⁵ ECF No. 64 at 11; *see also* ECF No. 54-9 at 4; ECF No. 54-10 at 4; ECF No. 60-1 at 6.

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 15 ⁷⁶ ECF No. 54-9 at 4 (defining “controller” as “a device, such as a specialized variable resistor,
 used to adjust current or voltage”); ECF No. 54-10 at 4 (defining “controller” as “[a] circuit,
 mechanism, device, or system, which monitors one or more variables and automatically makes
 the necessary adjustments in order to maintain operation within the specified parameters”); ECF
 No. 60-1 at 6 (defining “controller” as “[a] device or group of devices that serves to govern, in
 some predetermined manner, the electric power delivered to the apparatus to which it is
 connected”).

16
 17 ⁷⁷ *See Phillips*, 415 F.3d at 1313 (“[T]he person of ordinary skill in the art is deemed to read the
 claim term not only in the context of the particular claim in which the disputed term appears, but
 in the context of the entire patent, including the specification.”); *see also Williamson*, 792 F.3d
 1339 (court reviewed the specification and prosecution history to determine if they imparted
 “structural significance to the term” as part of its § 112(f) analysis); *Apple Inc. v. Motorola, Inc.*,
 757 F.3d 1286, 1296 (Fed. Cir. 2014) (same), *overruled on other grounds by Williamson*, 792
 F.3d 1339; *Apex Inc. v. Raritan Computer, Inc.*, 325 F.3d 1364, 1373 (Fed. Cir. 2003) (same).

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 21 ⁷⁸ E.g., ’399 Patent, 12:50–14:40, Figs. 3–6 (examples with circuitry that is not microprocessor
 based).

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 23 ⁷⁹ E.g., *id.* at 14:52–15:11, Fig. 7 (example with microprocessor-based circuitry).

24 ⁸⁰ *Apex*, 325 F.3d at 1373.

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 26 ⁸¹ *See ’138 Patent*, Cl. 1 (noting that the controller is “coupled to the at least one LED and
 configured to receive a power-related signal from an alternating current (A.C.) power source that

1 “conveys the structural arrangement of the circuit’s components and provides additional limiting
 2 structure.”⁸² And other claims detail structural subcomponents such as an adjustment circuit and
 3 power circuitry.⁸³ So there is intrinsic and extrinsic evidence that the term “controller” would be
 4 “understood by persons of ordinary skill in the art to have a sufficiently definite meaning as the
 5 name for structure” when viewed in the context of the claims and specification.⁸⁴

6 Signify also cites to a series of cases in which courts found that the term “controller” was
 7 not subject to § 112(f).⁸⁵ In *Maxwell Limited v. Huawei Device USA Inc.*, the court observed
 8 that its decision that § 112(f) didn’t apply was “consistent with multiple courts that have found
 9 that ‘controller’ connotes structure that does not fall with the means-plus-function analysis.”⁸⁶
 10 Lepro, on the other hand, cites to two unpublished cases in which “control circuit” and “control”
 11 were found subject to § 112(f), and it notes that the “context provided for each patent is
 12 different.”⁸⁷ That is true, of course, but the number of courts finding “controller” not subject to
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14 provides signals other than a standard A.C. line voltage” and is also “configured to provide
 power to the at least one LED based on the power-related signal”); ’399 Patent, Cl. 7 (same).

15 ⁸² *Inventio AG v. ThyssenKrupp Elevator Americas Corp.*, 649 F.3d 1350, 1358 (Fed. Cir. 2011),
 16 overruled on other grounds by *Williamson*, 792 F.3d 1339; see also *Linear Tech. Corp. v. Impala*
Linear Corp., 379 F.3d 1311, 1320 (Fed. Cir. 2004).

17 ⁸³ E.g., ’399 Patent, Cl. 17. As I explain below, I also find that Lepro hasn’t rebutted the
 presumption that “adjustment circuit” and “power circuitry” are structural terms. See *infra*
 18 Sections II.D, II.E.

19 ⁸⁴ *Williamson*, 792 F.3d at 1349.

20 ⁸⁵ ECF No. 54 at 21–22.

21 ⁸⁶ *Maxell Ltd. v. Huawei Device USA Inc.*, 297 F. Supp. 3d 668, 748 (E.D. Tex. 2018).

22 ⁸⁷ ECF No. 60 at 16; see also *Intelligent Automation Design, LLC v. Zimmer Biomet CMF &*
Thoracic, LLC, 799 F. App’x 847, 851 (Fed. Cir. 2020) (construing a “control circuit”); *Fiber,*
LLC v. Ciena Corp., 792 F. App’x 789, 792 (Fed. Cir. 2019) (construing a “control” for
 operating a beam-directing device). Lepro also attempts to distinguish the cases that Signify
 23 cites on the grounds that none “involved a patent that expressly defined the term ‘controller,’”
 but this argument is unavailing in light of my finding that the specification didn’t define this
 term. ECF No. 60 at 15–16.

1 § 112(f) tends to undermine Lepro’s position that this is a nonce word or a generic substitute for
 2 means.

3 Finally, during the *Markman* hearing Lepro’s counsel focused on the second part of the
 4 *Williamson* test—that the presumption against functional claiming “can be overcome . . . if the
 5 challenger demonstrates that the claim term . . . recites ‘function without reciting sufficient
 6 structure for performing that function.’”⁸⁸ Counsel argued that the term “controller” was too
 7 broad or vague to be sufficient structure for performing the claimed functions. But the Federal
 8 Circuit has long held that a term need not describe a specific or precise structure for the
 9 presumption against functional claiming to remain intact.⁸⁹ Identifying a class of structures that
 10 a POSITA would understand as capable of performing the claimed function is sufficient.⁹⁰ And,
 11 to the extent that Lepro is arguing that a POSITA wouldn’t understand a “controller” as structure
 12 *for* performing the claimed functions,⁹¹ it doesn’t explain why this is the case.

13 Ultimately, it was Lepro’s burden to rebut the presumption against functional claiming
 14 and demonstrate that § 112(f) applies to the term “controller.” “To overcome this presumption,
 15 [Lepro] had to show, by a preponderance of evidence, that persons of ordinary skill in the art

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 17 ⁸⁸ *Williamson*, 792 F.3d at 1349 (citing *Watts* 232 F.3d at 880).

18 ⁸⁹ See *Dyfan, LLC v. Target Corp.*, 28 F.4th 1360, 1366 (Fed. Cir. 2022) (quoting *Apple Inc.*, 757
 19 F.3d at 1299 (noting that “[c]laim terms ‘need not connote a single, specific structure,’ and may
 20 instead ‘describe a class of structures’ and still recite ‘sufficiently definite structure’ not to
 21 invoke” § 112(f)); *Watts*, 232 F.3d at 880 (quoting *Personalized Media Commc’ns, LLC v. Int’l
 22 Trade Comm’n*, 161 F.3d 696, 705 (Fed. Cir. 1998)) (noting that “the claim limitation need not
 23 ‘connote a precise physical structure’” to avoid application of § 112(f)); *Personalized Media*,
 161 F.3d at 705 (the fact that a term did “not connote a precise physical structure in the minds of
 those of skill in the art” did not “detract[] from the definiteness of structure”); see also *Rodime
 PLC v. Seagate Tech., Inc.*, 174 F.3d 1294, 1304 (Fed. Cir. 1999) (claim need “not recite every
 last detail of structure” in order to rebut presumption that § 112(f) *does* apply; rather “the claim
 need only recite ‘sufficient’ structure to perform entirely the claimed function”).

⁹⁰ See *XR Commc’ns, LLC*, 2023 WL 3529830, at *2–3; see also *Dyfan*, 28 F.4th at 1366.

⁹¹ See *XR Commc’ns, LLC*, 2023 WL 3529830, at *2–3.

1 would not have understood the ‘[controller]’ limitation[] to connote structure in light of the claim
 2 as a whole.”⁹² But there is both intrinsic and extrinsic evidence that the term “controller,” even
 3 “by itself[,] connotes some structure” and that the term, viewed in the context of the claims and
 4 specifications, would have a structural meaning understood by a POSITA at the time of
 5 invention.⁹³ So “[i]n the absence any more compelling evidence of the understanding of one of
 6 ordinary skill in the art, the presumption that § 112(f) does not apply is determinative.”⁹⁴ And
 7 Lepro simply hasn’t met its burden of showing by a preponderance of the evidence “that one of
 8 ordinary skill in the art believes the term does not recite sufficiently definite structure”⁹⁵ or
 9 “recites ‘function without reciting sufficient structure for performing that function.’”⁹⁶ So I find
 10 that § 112(f) doesn’t apply to the term “controller” here and that the term should be afforded its
 11 plain and ordinary meaning.⁹⁷

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⁹² *Dyfan*, 28 F.4th at 1367 (citing *Apex*, 325 F.3d at 1372–73).

⁹³ *Id.* (citing *Apex*, 325 F.3d at 1372–73).

⁹⁴ *Apex*, 325 F.3d at 1373; *see also Dyfan*, 28 F.4th at 1366 (same).

⁹⁵ *Id.*

⁹⁶ *Williamson*, 792 F.3d at 1349 (citing *Watts*, 232 F.3d at 880).

⁹⁷ Lepro argues only that this is a means-plus-function term and doesn’t propose an alternative construction.

1 **D. “Adjustment circuit”**

2 Signify’s Proposed 3 Construction	4 Lepro’s Proposed 5 Construction	6 Court’s Construction
7 Plain and ordinary meaning 8 (If construction required: “A 9 circuit that adjusts”)	10 Means-plus-function term	11 Plain and ordinary meaning

12 Lepro argues that “adjustment circuit” in the ’399 and ’138 patents is a means-plus-function term subject to § 112(f).⁹⁸ Signify contends that the term connotes structure and should be afforded its plain and ordinary meaning.⁹⁹

13 Signify argues that “[c]ourts have generally interpreted the term ‘circuit’ to connote

14 structure”¹⁰⁰ and cites to *Linear Technology Corporation v. Impala Linear Corporation* for the

15 proposition that “[t]his is particularly true when the patent recites the performed function.”¹⁰¹

16 Lepro counters that *Linear* is “inapplicable” because “it was decided eleven years before

17 *Williamson* clarified the proper analysis under § 112(f).¹⁰² But *Williamson* overruled a line of

18 cases applying a heightened burden or “strong presumption” against functional claiming in the

19 absence of the term “means,” it did not overrule *Linear*’s general approach to analyzing circuit

20 terms under § 112(f).¹⁰³ Indeed, this approach traces back to the 2003 decision of *Apex Inc. v.*

21 *Raritan Computer, Inc.*, which predates the “strong presumption” line of cases that the

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19 ⁹⁸ ECF No. 60 at 20.

20 ⁹⁹ ECF No. 54 at 26.

21 ¹⁰⁰ *Id.* (citing *Massachusetts Inst. of Tech. & Elecs. For Imaging, Inc. v. Abacus Software*, 462 F.3d 1344, 1355 (Fed. Cir. 2006)).

22 ¹⁰¹ *Id.* (citing *Linear Tech. Corp. v. Impala Linear Corp.*, 379 F.3d 1311, 1320–21 (Fed. Cir. 2004)).

23 ¹⁰² ECF No. 60 at 21.

24 ¹⁰³ See *Williamson*, 792 F.3d at 1347–49.

1 *Williamson* court overruled.¹⁰⁴ So the understanding that the term “circuit” connotes some
 2 structure and will generally convey “sufficient structural meaning” to a POSITA when “coupled
 3 with a description of the circuit’s operation”¹⁰⁵ is still good law. And as Signify points out,¹⁰⁶
 4 courts continue to cite to *Linear* for this specific proposition in post-*Williamson* decisions.¹⁰⁷

5 Lepro also seeks to distinguish *Linear* on the ground that there was expert testimony in
 6 that case that a POSITA would have been able to draw the circuits at issue based on their
 7 names.¹⁰⁸ But while the *Linear* court did consider such evidence, it didn’t indicate that this was
 8 required, and it evaluated a number of other factors as well.¹⁰⁹ Other courts, too, have used this
 9 same analytical framework to find that circuit-based terms were not subject to § 112(f) in the
 10 absence of such testimony.¹¹⁰ So the fact that Signify has not presented expert testimony on this
 11 issue is likewise not determinative here.

12 *Apex*, *Linear*, and other cases discussing circuit limitations indicate that “adjustment
 13 circuit” would be “understood by persons of ordinary skill in the art to have a sufficiently
 14 definite meaning as the name for structure.”¹¹¹ The term “circuit” by itself connotes at least
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16 ¹⁰⁴ See *Apex*, 325 F.3d at 1373; see also *Williamson*, 792 F.3d at 1347–49 (overruling the “strong
 17 presumption” line of cases starting with the 2004 decision *Lighting World, Inc. v. Birchwood
 18 Lighting, Inc.*, 382 F.3d 1354 (Fed. Cir. 2004), in which this standard was “applied for the first
 time”).

19 ¹⁰⁵ *Linear*, 379 F.3d at 1320 (citing *Apex*, 325 F.3d at 1373).

20 ¹⁰⁶ ECF No. 64 at 13.

21 ¹⁰⁷ See, e.g., *Entropic Commc’ns, LLC v. Charter Commc’ns, Inc.*, 2023 WL 4181266, at *6
 (E.D. Tex. June 26, 2023); *Google LLC v. Sonos, Inc.*, 2021 WL 2321952, at *5 (N.D. Cal. June
 7, 2021).

22 ¹⁰⁸ ECF No. 60 at 21.

23 ¹⁰⁹ *Linear*, 379 F.3d at 1320–21.

¹¹⁰ See, e.g., *Apex*, 325 F.3d at 1373; *Google*, 2021 WL 2321952, at *5–6.

¹¹¹ *Williamson*, 792 F.3d at 1349.

1 some structure.¹¹² Including the term “adjustment” as a modifier or “adjectival qualification[]
 2 further identif[ies] sufficient structure to perform the claimed functions to one of ordinary skill in
 3 the art”¹¹³ by “narrow[ing] the scope of those structures covered by the claim and mak[ing] the
 4 term more definite.”¹¹⁴ The “adjustment circuit” is part of the “controller” in all asserted
 5 claims¹¹⁵ and in two of them is also “coupled to the D.C. converter” contained in certain claims’
 6 “power circuitry.”¹¹⁶ Such connections impart further structural context.¹¹⁷ All of the claims
 7 also describe the objectives of the “adjustment circuit,”¹¹⁸ and this language “conveys the
 8 structural arrangement of the circuit’s components and provides additional limiting structure.”¹¹⁹
 9 Plus, the specification contains structural descriptions and drawings of an exemplary
 10 embodiment of an “adjustment circuit,” which only further indicates that a POSITA viewing the
 11 term in this context would understand it to have a structural nature.¹²⁰

12 There is intrinsic evidence that “adjustment circuit” would have been understood by a
 13 POSITA as having structural meaning, so Lepro had to provide “more compelling evidence of
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16 ¹¹² See *Apex*, 325 F.3d at 1373.

17 ¹¹³ *Id.* at 1374 (citing *Personalized Media*, 161 F.3d at 703).

18 ¹¹⁴ *Personalized Media*, 161 F.3d at 703.

19 ¹¹⁵ ’138 Patent, Cls. 20, 22; ’399 Patent, Cls. 17, 19.

20 ¹¹⁶ ’138 Patent, Cl. 22; ’399 Patent, Cl. 19

21 ¹¹⁷ See *Inventio AG*, 649 F.3d at 1358–59.

22 ¹¹⁸ E.g., ’399 Patent, Cl. 17 (describing “an adjustment circuit to variably control the at least one parameter of light based on the varying power-related signal”); *id.* at Cl. 19 (noting that the “adjustment circuit” of claim 17 is further “configured to variably control the at least one LED based on the filtered rectified power-related signal” provided by the power circuitry described in claim 18).

23 ¹¹⁹ *Inventio AG*, 649 F.3d at 1358; *see also Linear Tech. Corp.*, 379 F.3d at 1320.

24 ¹²⁰ E.g., ’399 Patent, Fig. 6, 14:14–29.

¹²¹ the understanding of one of ordinary skill in the art” to overcome the presumption.”¹²¹ Because it failed to do so, I find that § 112(f) doesn’t apply to the term “adjustment circuit.”¹²²

E. "Power circuitry"

Signify's Proposed Construction	Lepro's Proposed Construction	Court's Construction
Plain and ordinary meaning (If construction required: “Components of a circuit that provides power”)	Means-plus-function term	Plain and ordinary meaning

8 Lepro contends that “power circuitry” is “no different than saying ‘power means’” so this
9 term should also be subject to § 112(f).¹²³ Signify argues that “power circuitry” instead “is a
10 common term that would be readily understood by a person of ordinary skill of art at the time of
11 invention.”¹²⁴

Lepro’s argument on this term mirrors its arguments for “controller” and “adjustment circuit” and fails for the same reasons. The term “circuitry,” even in the abstract, connotes some structure,¹²⁵ and there is no indication that the term is used here in a way that is inconsistent with its plain and ordinary meaning as understood by a POSITA.¹²⁶ The “power” modifier “further identif[ies] sufficient structure to perform the claimed functions to one of ordinary skill in the art”¹²⁷ by “narrow[ing] the scope of those structures covered by the claim and mak[ing] the term

¹⁹ ¹²¹ *Apex*, 325 F.3d at 1373; see also *Dyfan*, 28 F.4th at 1366 (same).

²⁰ ¹²² Lepro argues only that this is a means-plus-function term and doesn't propose an alternative construction.

²¹ ¹²³ ECF No. 60 at 23.

124 ECF No. 54 at 29.

²² See *Apex*, 325 F.3d at 1373.

23 | ¹²⁶ *Id.* at 1373–1374.

¹²⁷ *Id.* at 1374 (citing *Personalized Media*, 161 F.3d at 703).

1 more definite.”¹²⁸ In every asserted claim at issue, the “power circuitry” is a part of a
 2 controller¹²⁹ that is coupled to at least one LED, and these connections impart further structural
 3 context.¹³⁰ Even the claims that provide the least amount of detail about the “power circuitry”
 4 describe its objectives and outputs¹³¹ which “conveys the structural arrangement of the
 5 circuit[ry]’s components and provides additional limiting structure.”¹³² Two of the four asserted
 6 claims recite their power circuitry’s structural subcomponents—a rectifier, a low-pass filter, and
 7 a D.C. converter—as well as these individual circuits’ objectives and outputs.¹³³ And the way
 8 “power circuitry” is discussed in the written description and depicted in figures also supports the
 9 conclusion that a POSITA would understand the term to have “a sufficiently definite meaning as
 10 the name for structure”¹³⁴ when viewed in light of the claims and specification.¹³⁵

11 Lepro highlights that the dictionary definition of “power circuitry” Signify offers
 12 involves “wires,” and it notes that the power circuitry of the ’138 and ’399 patents achieves
 13 results that “mere ‘wires’” couldn’t.¹³⁶ This, according to Lepro, proves “that the term ‘power
 14 circuitry’ does not denote a definite structure.”¹³⁷ But even assuming that this statement is valid,
 15 the term “power circuitry” doesn’t need to denote *a* definite structure; it needs to connote

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17¹²⁸ *Personalized Media*, 161 F.3d at 703.

18¹²⁹ ’138 Patent, Cls. 20, 21; ’399 Patent, Cls. 17, 18.

19¹³⁰ See *Inventio AG*, 649 F.3d at 1358–59.

20¹³¹ See ’138 Patent, Cl. 20; ’399 Patent, Cl. 17.

21¹³² *Inventio AG*, 649 F.3d at 1358; see also *Linear Tech. Corp.*, 379 F.3d at 1320.

22¹³³ See ’138 Patent, Cl. 21; ’399 Patent, Cl. 18.

23¹³⁴ *Williamson*, 792 F.3d at 1349.

¹³⁵ See ’399 Patent, Figs. 4–8, 18:44–19:16.

¹³⁶ ECF No. 60 at 24. Lepro doesn’t cite any evidence in support of this statement.

¹³⁷ *Id.*

1 sufficiently definite structure or sufficient structure for performing the claimed function, and
 2 identifying a class of structures is enough to satisfy these standards.¹³⁸

3 Otherwise, Lepro basically just reiterates the argument it advances for the terms
 4 “controller” and “adjustment circuit,” contending that “power circuitry” is simply a generic,
 5 black-box term for structure that is no different than the term “means.”¹³⁹ It highlights that the
 6 embodiments show either boxes labeled “power circuitry” or specific exemplary drawings of
 7 said circuitry.¹⁴⁰ But the fact that the term appears in a box in an embodiment doesn’t
 8 automatically render it a black-box term that is a generic substitute for “means.” And Lepro
 9 doesn’t address the indicia of structure imparted by the term itself and the surrounding claim
 10 language, nor does Lepro provide actual evidence that a POSITA wouldn’t believe that the term
 11 recites sufficiently definite structure or sufficient structure to perform the claimed functions.¹⁴¹

12 As with “controller” and “adjustment circuit,” Lepro failed meet its burden and rebut the
 13 presumption that § 112(f) doesn’t apply. So I find that “power circuitry” is not a means-plus-
 14 function term, and I afford it the plain and ordinary meaning.¹⁴²

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¹³⁸ See *Dyfan*, 28 F.4th at 1366 (quoting *Apple Inc.*, 757 F.3d at 1299) (noting that “[c]laim terms ‘need not connote a single, specific structure,’ and may instead ‘describe a class of structures’ and still recite ‘sufficiently definite structure’ not to invoke” § 112(f)).

21 ¹³⁹ ECF No. 60 at 23.

22 ¹⁴⁰ *Id.*

23 ¹⁴¹ *Apex*, 325 F.3d at 1373.

¹⁴² Lepro argues only that this is a means-plus-function term and doesn’t propose an alternative construction.

1 **III. U.S. Patent No. 7,348,604**

2 **A. Overview**

3 The '604 patent is titled “light-emitting module” and “pertains to the field of lighting
 4 systems and in particular to a light-emitting module with versatile electromechanical mounting,
 5 connecting, and assembly capabilities.”¹⁴³ The patent describes a module that is comprised of a
 6 thermally conductive substrate that is “thermally connected” to one or more light-emitting
 7 elements, a heat-dissipation element thermally coupled to said substrate, and “a housing element
 8 including fastening means for detachably coupling the housing element to the heat dissipation
 9 element.”¹⁴⁴ The patent also teaches that the “housing element” includes a “transparent region”
 10 that enables “transmission of light emitted by the one or more light-emitting elements.”¹⁴⁵
 11 According to the patentee, the benefit of this simplified design is that it “improve[s]
 12 manufacturing, simplif[ies] assembly, and provide[s] ease of maintenance.”¹⁴⁶ The module is
 13 also “further configured to provide the ability to create a lighting system comprising multiple
 14 lighting-emitting modules through the interconnection of two or more light-emitting
 15 modules.”¹⁴⁷

21 ¹⁴³ '604 Patent, 1:5-10 (Field of Invention).

22 ¹⁴⁴ *Id.* at 2:64–3:9.

23 ¹⁴⁵ *Id.* at 3:10–12.

24 ¹⁴⁶ *Id.* at 2:49–51.

25 ¹⁴⁷ *Id.* at 4:65–5:2.

1 **B. “Light-emitting module”**

2 Signify’s Proposed 3 Construction	4 Lepro’s Proposed 5 Construction	6 Court’s Construction
7 Term appears in preamble, no 8 construction required 9 (If construction required: “A 10 self-contained assembly of 11 electronic components and 12 circuitry for emitting light”)	13 Preamble is limiting. 14 “ A packaged light emitting 15 device designed for use with 16 other light[-]emitting devices ” ¹⁴⁸	17 Preamble is not limiting

18 Lepro proposes that the term “light-emitting module,” which appears in the ’604 patent’s
19 sole independent claim’s preamble, be construed as limiting the invention to “[a] packaged
20 light[-]emitting device designed for use with other light[-]emitting devices.”¹⁴⁸ Signify argues
21 that no construction is necessary because preamble language is generally not limiting and that
22 none of the exceptions to that rule is applicable.¹⁴⁹

23 “[A]s a general rule[,] preamble language is not treated as limiting.”¹⁵⁰ It may, however,
24 “limit the invention if it recites essential structure or steps or if it is necessary to give life,
25 meaning, and vitality to the claim.”¹⁵¹ On the other hand, the Federal Circuit has “long ruled that
26 a preamble is not limiting [if] a patentee defines a structurally complete invention in the claim
27 body and uses the preamble to only state a purpose or intended use for the invention.”¹⁵²

19 ¹⁴⁸ ECF No. 60 at 25.

20 ¹⁴⁹ ECF No. 54 at 34.

21 ¹⁵⁰ *Cochlear Bone Anchored Sols. AB v. Oticon Med. AB*, 958 F.3d 1348, 1354 (Fed. Cir. 2020)
22 (quoting *Aspex Eyewear, Inc. v. Marchon Eyewear, Inc.*, 672 F.3d 1335, 1347 (Fed. Cir. 2012)).

23 ¹⁵¹ *Id.* (quoting *Catalina Mktg. Int’l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002)) (cleaned up).

24 ¹⁵² *Id.* (quoting *Arctic Cat Inc. v. GEP Power Prods., Inc.*, 919 F.3d 1320, 1327 (Fed. Cir. 2019)).

1 The Federal Circuit's opinion in *Arctic Cat Inc. v. GEP Power Products Inc.*, with facts
 2 that closely parallel those here, establishes that the term "light-emitting module" should not be
 3 construed as limiting.¹⁵³ The preamble language at issue in *Arctic Cat* was "power distribution
 4 module for a personal recreational vehicle,"¹⁵⁴ and it was that latter part of that term ("for a
 5 personal recreational vehicle") that the plaintiff argued was limiting.¹⁵⁵ The Federal Circuit
 6 disagreed, reasoning that "the reference to a 'personal recreational vehicle' merely identifies an
 7 intended use for the claimed power distribution module."¹⁵⁶ The plaintiff did not demonstrate
 8 "that the identified use itself imposes any structural requirement on the claimed module beyond
 9 what [wa]s required by the bodies of the claims" and had not "shown any 'reliance on the
 10 preamble during prosecution to distinguish the claimed invention from prior art.'"¹⁵⁷ So the
 11 Federal Circuit found that the preamble language was not limiting.¹⁵⁸

12 The preamble language at issue in *Arctic Cat*, "for a personal recreational vehicle,"¹⁵⁹
 13 mirrors Lepro's proposed "designed for use with other light[-]emitting devices" limitation.¹⁶⁰ As
 14 Lepro points out, various statements in the '604 patent do suggest that it was designed, at
 15 minimum, to be compatible with such a use.¹⁶¹ But this is no different than *Arctic Cat*, in which

17¹⁵³ *Arctic Cat*, 919 F.3d at 1327.

18¹⁵⁴ *Id.* at 1327–30.

19¹⁵⁵ *Id.* at 1328.

20¹⁵⁶ *Id.*

21¹⁵⁷ *Id.* (quoting *Catalina*, 289 F.3d at 808).

22¹⁵⁸ *Id.* at 1329–30.

23¹⁵⁹ *Id.* at 1327–30.

¹⁶⁰ ECF No. 60 at 25.

¹⁶¹ See, e.g., '604 Patent 4:65–5:2 ("The light-emitting module according to the present invention is further configured to provide the ability to create a lighting system comprising multiple lighting-emitting modules through the interconnection of two or more light-emitting modules.").

1 the patents' titles, specifications, and preambles indicated that those modules were designed to
 2 be used in personal recreational vehicles.¹⁶² So to the extent that the term "light-emitting
 3 module" implies that this invention was "designed to be used with other light-emitting devices,"
 4 this, like in *Arctic Cat*, merely identifies a purpose or intended use for the invention.

5 Lepro argues that the term "light-emitting module" is limiting because it "recites essential
 6 structure."¹⁶³ But Lepro doesn't describe what this purported "essential structure" actually is.¹⁶⁴
 7 Like the plaintiff in *Arctic Cat*, Lepro fails to explain how the invention's overall "modular
 8 characteristic" or an intent that it be used along with other modules "imposes any structural
 9 requirement on the claimed module beyond what is required by the bod[y] of" claim 1.¹⁶⁵ Even
 10 the broad reading of the term "light-emitting module" that Lepro advances does not add any
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13¹⁶² *Arctic Cat*, 919 F.3d at 1322 (noting that the two patents at issue were "both titled 'Power
 14 Distribution Module for Personal Recreational Vehicle'"); *id.* at 1327–30. Lepro also notes that
 15 the "[t]he modular characteristic is touted repeatedly as a feature of the present invention" and
 16 cites cases in which courts referenced similar language in support of limiting the scope of a
 17 claim. ECF No. 60 at 26 n.90. But all of these cases are inapposite because they involved
 18 construing claim-body terms (rather than reading in additional limitations from preambles) and
 19 are also distinguishable because they dealt with limiting a claim's scope based on specific
 20 features described in the specification (rather than broad statements about the overall invention's
 21 intended use). See *Fenner Invs., Ltd. v. Cellco P'ship*, 778 F.3d 1320, 1322, 1324 (Fed. Cir.
 22 2015); *Trading Techs. Int'l, Inc. v. eSpeed, Inc.*, 595 F.3d 1340, 1352–54 (Fed. Cir. 2010);
 23 *Honeywell Int'l, Inc. v. ITT Indus., Inc.*, 452 F.3d 1312, 1315, 1318 (Fed. Cir. 2006).

19¹⁶³ ECF No. 60 at 26–27.

20¹⁶⁴ *Id.*; see *Catalina*, 289 F.3d at 808 (citing *Corning Glass Works v. Sumitomo Elec. U.S.A. Inc.*,
 21 868 F.2d 1251, 1257 (Fed. Cir. 1989)) (emphasis added) ("[W]hen reciting *additional* structure
 22 or steps underscored as important by the specification, the preamble may operate as a claim
 23 limitation.").

22¹⁶⁵ *Arctic Cat*, 919 F.3d at 1328. Lepro does assert that "a POSITA would have understood the
 23 claimed 'light-emitting module' to be an essential structural limitation because the '604
 inventors were not working on general improvements for any type of LED luminaires." ECF
 No. 60 at 27. But this, again, merely goes to the invention's purpose or intended use, not the
 actual structures it comprises.

1 structure essential to the module itself—it at most “merely adds structure of which the body-
 2 recited module is a part.”¹⁶⁶

3 This case is therefore unlike *Deere & Co. v. Bush Hog, LLC*, in which the court found the
 4 preamble limiting because it informed the meaning of a specific structural limitation in the
 5 claim’s body.¹⁶⁷ The “rotary cutter deck” preamble language there was “necessary to understand
 6 the subject matter encompassed by the claim,” which otherwise merely recited a “box section
 7 having torsional stiffness.”¹⁶⁸ In particular, it “inform[ed] the meaning of the ’torsional stiffness
 8 limitation” because the claimed box section needed to “possess sufficient stiffness to withstand
 9 the torsional loads imposed by the operation of a rotary cutter.”¹⁶⁹ But Lepro has not argued that
 10 the ’604 patent’s “modular characteristic” informs the meaning of or further limits any of the
 11 actual claim structures described in the body of claim 1—the substrate, heat-dissipation element,
 12 and housing element. Rather, all of Lepro’s arguments focus on limiting the overall module
 13 itself by a potential use that factored into its design.

14 *Corning Glass Works v. Sumitomo Electric U.S.A, Inc.*, which Lepro also cites, is
 15 similarly distinguishable. The preamble language described the invention at issue as an “optical
 16 waveguide,” which is “a unique type of optical fiber.”¹⁷⁰ And for it to function as an “optical
 17 waveguide” (rather than just a “general improvement[] in conventional optical fibers”) the
 18 invention required “a particular structural relationship defined in the specification” but not
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21¹⁶⁶ *Arctic Cat*, 919 F.3d at 1329.

22¹⁶⁷ *Deere & Co. v. Bush Hog, LLC*, 703 F.3d 1349, 1358 (Fed. Cir. 2012).

23¹⁶⁸ *Id.* (quoting U.S. Patent No. 6,052,980, 4:44–53).

¹⁶⁹ *Id.*

¹⁷⁰ *Corning Glass*, 868 F.2d at 1256 (quoting U.S. Patent No. 3,659,915, 1:34–39)

1 actually reflected in the body of the claim.¹⁷¹ But Lepro has not contended, much less
 2 demonstrated, that the light-emitting module will not function as intended unless some additional
 3 structural limitations are read into claim 1.

4 So while Lepro highlights a number of exceptions to the general rule that a preamble is
 5 not limiting, none of them applies here. This preamble does not “impose[] any structural
 6 requirement on the claimed module beyond what is required by the bod[y] of” the claim,¹⁷² nor
 7 is it essential to understand limitations in the actual body of the claim.¹⁷³ Lepro has not shown
 8 that, in the absence of further limitations, the invention is not structurally complete.¹⁷⁴ At
 9 bottom, Lepro’s position is that the invention’s intended purpose should further limit the claim’s
 10 scope. But this argument is inconsistent with Federal Circuit precedent.¹⁷⁵ So I find that the
 11 term “light-emitting module” is not limiting.

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¹⁷¹ *Corning Glass*, 868 F.2d at 1257 (“The invention is restricted to those fibers that work as waveguides as defined in the specification, which is not true with respect to fibers constructed with the limitations of paragraphs (a) and (b) only. Thus, we conclude that the claim preamble in this instance does not merely state a purpose or intended use for the claimed structure.”).

¹⁷² *Arctic Cat*, 919 F.3d at 1328.

¹⁷³ *Deere & Co.*, 703 F.3d at 1358.

¹⁷⁴ *Arctic Cat*, 919 F.3d at 1328.

¹⁷⁵ *Id.*

1 C. “Fastening means”

2 Signify's Proposed 3 Construction	4 Lepro's Proposed 5 Construction	6 Court's Construction
7 Function: detachably 8 coupling the housing element 9 to the heat-dissipation 10 element.	11 Function: releasably 12 connecting the housing element to the heat-dissipation element.	13 Function: detachably 14 coupling the housing element to the heat-dissipation element.
15 Structure: fastening means as 16 described at 5:18–24, 6:18– 17 24, 7:25–26., 7:42–51, 7:55– 18 67 and/or identified by 19 reference numeral 450 in 20 Figure 4 and equivalents 21 thereof.	22 Structure: The tabs 450 23 shown in Figure 4 and 24 described in col. 7:42–51 and 25 their structural equivalents.	26 Structure: The tabs 450 27 shown in Figure 4 and 28 described at 7:42–51 and 29 their structural equivalents.

10 The parties agree that the term “fastening means” is a means-plus-function limitation that

11 invokes § 112(f), but they disagree over how the function and corresponding structure should be

12 construed.¹⁷⁶ “The construction of a means-plus-function limitation follows a two-step

13 approach.”¹⁷⁷ The court must first “identify the claimed function, staying true to the claim

14 language and the limitations expressly recited by the claims.”¹⁷⁸ “Once the functions performed

15 by the claimed means are identified, [the court] must then ascertain the corresponding structures

16 in the written description that perform those functions.”¹⁷⁹ “A disclosed structure is

17 corresponding ‘only if the specification or the prosecution history clearly links or associates that

18 structure to the function recited in the claim.’”¹⁸⁰

21 ¹⁷⁶ ECF No. 54 at 37; ECF No. 60 at 27.

22 ¹⁷⁷ *Omega Eng'g, Inc.*, 334 F.3d at 1321.

23 ¹⁷⁸ *Id.* (citing *Cardiac Pacemakers, Inc.*, 296 F.3d at 1113 (internal citation omitted)).

24 ¹⁷⁹ *Id.* (citing *Cardiac Pacemakers*, 296 F.3d at 113).

25 ¹⁸⁰ *Id.* (quoting *B. Braun Med. Inc. v. Abbot Lab'yrs*, 124 F.3d 1419, 1424 (Fed. Cir. 1997)).

1 ***I. Function***

2 Signify argues that the function should be the one listed in the independent claim at
 3 issue,¹⁸¹ which notes that the housing element includes a fastening means “for detachably
 4 coupling the housing element to the heat[-]dissipation element.”¹⁸² Signify contends that
 5 “‘detachably’ and ‘coupling’ are plain English words,” and that “[t]here is simply no basis to
 6 rewrite the straightforward function of the recited fastening means.”¹⁸³ Lepro counters that the
 7 only structure that corresponds to this function are the “tabs” designated by reference numeral
 8 450 in Figure 4 (“the Figure 4 tabs”) and that, because the specification describes the Figure 4
 9 tabs as securing “a releasable connection” between the housing and heat-dissipation elements,
 10 the court should construe the function as “releasably connecting” instead.¹⁸⁴ Lepro also posits
 11 that its preferred construction would resolve “potential ambiguity” that might arise because
 12 Signify “intends its construction to cover-non-releasable couplings implemented by permanent
 13 . . . or semi-permanent fasteners” described in a part of the specification.¹⁸⁵

14 Lepro essentially imports its structural position over to its functional argument, but it
 15 cites no authority for the proposition that unambiguous functional language in a claim should be
 16 modified to conform with arguably narrower language used alongside a specific corresponding
 17 structure in the specification. And any potential ambiguity regarding permissible structures is
 18 mooted by my findings in the next section. In short, “detachably” and “coupling” are plain
 19 English words, and Lepro has not shown that I need to further construe them. So I “stay[] true to
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21 ¹⁸¹ ECF No. 57 at 29.

22 ¹⁸² ’604 Patent, Cl. 1.

23 ¹⁸³ ECF No. 54 at 37–38.

24 ¹⁸⁴ ECF No. 60 at 32 (citing ’604 Patent, 7:42–51).

25 ¹⁸⁵ *Id.* at 32.

1 the claim language and the limitations expressly recited by the claims”¹⁸⁶ and construe the
 2 function as “detachably coupling the housing element to the heat-dissipation element.”

3 ***2. Corresponding structure***

4 Signify argues that “the ’604 Patent provides numerous different examples of coupling
 5 parts and highlights language from the specification that lists various examples of “mechanical
 6 fasteners,” “magnetic mounting systems,” and “adhesives.”¹⁸⁷ It contends that “fastening
 7 means” structure should include all of these examples plus the tabs described in the specification
 8 and featured in Figure 4.¹⁸⁸ Lepro responds that these examples do not correspond to the
 9 claimed function and that the only structure in the specification that is clearly linked to said
 10 function are the Figure 4 tabs.¹⁸⁹

11 *i. The “fastening means” examples Signify highlights are not
 12 clearly linked with the “detachably coupling” function.*

13 The parties’ dispute focuses on a paragraph from column 5 of the specification,¹⁹⁰ which
 14 lists examples of different types of fastening means:

15 In one embodiment, the light-emitting modules are mechanically
 16 mounted to various receiving means or [a] mounting system such
 17 as a track, or similar structure as would be readily understood.
 18 Where the light emitting modules are mounted to a track, for
 19 example, the track may be attached to various structures such as

18¹⁸⁶ *Id.* (citing *Cardiac Pacemakers, Inc.*, 296 F.3d at 1113 (internal citation omitted)).

19¹⁸⁷ ECF No. 54 at 38–39.

20¹⁸⁸ *Id.*; see also ’604 Patent, Fig. 4, 7:42–51.

21¹⁸⁹ ECF No. 60 at 28.

22¹⁹⁰ Signify’s proposed construction also references a few other sentences in the written
 23 description where it contends corresponding structure can be found. See ECF No. 54 at 37
 (stating that corresponding structure for the “detachably coupling” function is also found at ’604
 Patent, 5:18–24, 6:18–24, 7:25–26, 7:55–67). While some of these sentences do indeed
 reference “fastening means” in the context of the “detachably coupling” function, none of them
 provide specific examples of actual structures that can perform that function.

1 the inside back wall of a canopy, or any other surface as would be
 2 readily understood. **Alternatively, the light-emitting modules**
 3 **can be mounted to a desired location by fastening means. The**
 4 **fastening means can be mechanical fasteners for example,**
 5 **screws, bolts [or] rivets or the like, magnetic mounting systems,**
 6 **adhesives for example, pressure sensitive tape, glue or epoxy or**
 7 **the like, or other forms of fastening means as would be**
 8 **understood by a worker skilled in the art.**¹⁹¹

9
 10 The first textual clue that the structures listed here do not correspond to the function at
 11 issue (detachably coupling the heat-dissipation and housing elements in the light-emitting
 12 module) is that they directly correspond to an entirely different function (mounting an entire
 13 light-emitting module or multiple modules to some external structure). Signify cites to *Pedigo*
 14 *Products, Inc. v. Kimberly-Clark Worldwide, Inc.* for the proposition that the same structures can
 15 perform multiple functions.¹⁹² But *Pedigo Products* also makes it clear that the structure must
 16 still be clearly linked to the function at issue,¹⁹³ and this paragraph doesn't mention the heat-
 17 dissipation element, the housing element, or the "detachably coupling" function at all.¹⁹⁴ It
 18 exclusively discusses various ways to mount complete light-emitting modules on external
 19 mounting systems, tracks, surfaces, etc.¹⁹⁵ The use of the term "fastening means" is the only
 20 arguable "link" between the column 5 structures and the claimed function. But the surrounding

19¹ '604 Patent, 5:11–24 (emphasis added).

19² ECF No. 64 at 20 (citing *Pedigo Prods., Inc v. Kimberly-Clark Worldwide, Inc.*, 2014 WL 12776227, at *23 (N.D. Ga. Aug. 20, 2014)).

19³ *Pedigo Prods.*, 2014 WL 12776227, at *24 (finding structure *was* clearly linked when the specification noted that it was attached to the specific area that the claimed function involved, but finding another structure *was not* clearly linked to that function when the descriptions of the structure did not include "any reference to the relevant claimed function").

19⁴ '604 Patent, 5:11–24.

19⁵ *Id.*

1 language and context of the term’s use in this paragraph effectively severs any opaque link that
 2 this common usage might have created.¹⁹⁶

3 Any potential link between the column 5 examples and the claimed function is also
 4 undermined by other intrinsic evidence. While both parties focus on the permanence or
 5 detachability of some of the examples,¹⁹⁷ the “magnetic mounting system” is perhaps the starker
 6 example of a structure that seems directed towards the function discussed in that specific
 7 paragraph—mounting light-emitting modules at desired locations.¹⁹⁸ The inclusion of “glue”
 8 and “epoxy” also cuts against Signify’s argument that the patentee intended claim 1’s fastening
 9 means to include all of these structures.¹⁹⁹ While described in this paragraph as potential
 10 “fastening means,” later—and in the specific context of attaching the housing and heat-
 11 dissipation elements—these same structures are described as potential “sealing means” that
 12 seemingly could be used *in addition* to the fastening means coupling those two elements in one

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¹⁹⁶ See *Omega Eng’g*, 334 F.3d at 1321 (quoting *B. Braun Med.*, 124 F.3d at 1424) (“A disclosed
 14 structure is corresponding ‘only if the specification or the prosecution history clearly links or
 15 associates that structure to the function recited in the claim.’”). Signify cites *Acromed Corp. v. Sofamor Danek Grp., Inc.*, 253 F.3d 1371, 1382–83 (Fed. Cir. 2001) and *Kinik Co. v. ITC*, 362 F.3d 1359, 1364 (Fed. Cir. 2004), for the proposition that a court should not “limit a patent to its
 16 preferred embodiments in the face of evidence of broader coverage by the claims.” See ECF No.
 17 54 at 39. There is no dispute that this, as a general proposition, is correct. But Signify still has
 18 to identify structures that clearly correspond to the claimed function, and as I explain below the
 19 only structure in the ’604 patent that does so is that shown by the Figure 4 tabs. *Acromed* is also
 20 materially distinguishable as the court was not assessing corresponding structure in the first
 instance—rather, it was analyzing whether the court should have imported *specific dimensions*
 discussed in the written description into the identified corresponding structure. 253 F.3d at
 1382–83. And *Kinik* did not involve identifying corresponding structure as part of a means-plus-
 function analysis. 362 F.3d at 1364–65.

¹⁹⁷ See ECF No. 60 at 30; ECF No. 64 at 20.

¹⁹⁸ ’604 Patent, 5:11–24. Notably, the ’604 patent never uses the term “mount” to describe the
 22 interaction between the housing and heat dissipation elements, and there is no indication
 23 elsewhere in the ’604 Patent that the patentee envisioned magnetically coupling or connecting
 these specific elements together.

¹⁹⁹ *Id.*

1 embodiment of the invention.²⁰⁰ Indeed, the '604 patent notes that, in this particular
 2 embodiment, the “attachment mechanism” connecting the housing and heat-dissipation elements
 3 “can be further employed . . . to press a sealing means such as glue or epoxy . . . between the
 4 housing element and the heat[-]dissipation element” to seal the cavity between these two
 5 elements “from environmental conditions.”²⁰¹ Dependent claim 12, which relies on claim 1,
 6 appears to relate to this particular embodiment.²⁰² But if the “fastening means” of claim 1
 7 already included glue and epoxy as potential structures for coupling the housing and heat-
 8 dissipation elements, then claim 12 would be superfluous rather than further limiting claim 1.

9 Signify’s position is also undermined by language in the '604 patent that suggests that the
 10 patentee envisioned the fastening means of claim 1 being integrated into the housing element.
 11 Claim 1, for example, provides that the invention comprises “a housing element *including*
 12 fastening means for detachably coupling the housing element to the heat[-]dissipation
 13 element.”²⁰³ And the specification also notes that “[t]he housing element *comprises* fastening
 14 means to secure the various components of the light-emitting module together.”²⁰⁴ These verbs
 15 imply that the patentee intended for these fastening means to actually be a part of the housing

200 *Id.* at 7:55–67.

201 *Id.*

202 *Id.* at Cl. 12 (emphasis deleted) (“The light-emitting module of claim 1, wherein a sealant substance is positioned between the housing element and the heat dissipation element for environmental sealing between the housing element and the heat dissipation element.”).

203 *Id.* at Cl. 1 (emphasis added).

204 *Id.* at 7:25–27 (emphasis added).

1 element,²⁰⁵ but several of the structures listed in column 5 (e.g., screws, bolts, rivets, glue,
 2 epoxy) would not generally be understood to be part of the components they attach.²⁰⁶

3 Signify highlights that the “’604 Patent discusses ‘fastening means’ and the
 4 interchangeability of components (including of the housing element) outside the context of the”
 5 Figure 4 tabs embodiment.²⁰⁷ It contends that this discussion undermines Lepro’s position that
 6 this is the only structure that corresponds to the “detachably coupling” function.²⁰⁸ But Signify
 7 fails to explain how the use of the Figure 4 tabs would make the housing element or other
 8 components any less interchangeable than, for example, the screws, bolts, and rivets from the
 9 column 5 examples that Signify touts, as the components would seemingly need to be fabricated
 10 with these types of fastening means in mind. Regardless, discussions of fastening means and
 11 interchangeability outside of the specific context of the Figure 4 tabs does not create a clear link
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13 ²⁰⁵ See *Include*, The New Oxford American Dictionary (2d ed. 2005) (defined as to “comprise or
 14 contain as part of a whole”); *Comprise*, The New Oxford American Dictionary (2d ed. 2005)
 15 (defined as to “consist of” or “be made up of”). In *Phillips*, the Federal Circuit found that use of
 16 the term “comprising” imposed a “clear requirement[]” that the objects being discussed “must be
 17 part of” the structure that comprised them. 415 F.3d at 1324. And as will be discussed in the
 18 following section, other extrinsic evidence supports this interpretation as well.

19 ²⁰⁶ ’604 Patent, 5:11–24. The parties also dispute whether evidence from the ’604 patent’s U.S.
 20 prosecution history—in particular, a statement made by an examiner in a notice of allowance—
 21 suggests that the fastening means of claim 1 must be integrated into the housing element. See
 22 ECF No. 54 at 40; ECF No. 60 at 31; ECF No. 64 at 21–22. The examiner noted that prior art
 23 “discloses including an adhesive 185 which serves as fastening means coupling substrate 160 to
 24 the heat dissipation, but fails to disclose that the fastening means (adhesive 185) is part of the
 25 housing 140.” ECF No. 54-12 at 3. As Lepro argues, this sentence structure does tend to
 26 suggest that the contrast the examiner was drawing between the ’604 Patent and the prior art was
 27 that the fastening means of the ’604 patent were “part of the housing,” whereas the prior art’s
 28 fastening means were not. But as Signify points out, the prior art’s fastening means appear to be
 29 for coupling the *substrate* (rather than the housing element) to the heat-dissipation element. ECF
 30 No. 54-12 at 3. Without additional context, the examiner’s statement does not provide clarity on
 31 this particular issue.

32 ²⁰⁷ ECF No. 64 at 19–20.

33 ²⁰⁸*Id.*

1 between the claimed function and the column 5 examples where one did not exist in the first
 2 place.

3 ii. *Statements made during a foreign patent prosecution support*
 4 *Lepro's position.*

5 Lepro also highlights statements that the '604 patent applicant made to the European
 6 Patent Office related to a patent application with the "same specification" and a claim 1 that is
 7 the same as that of the '604 patent.²⁰⁹ At various points, the applicant describes the fastening
 8 means as being "included in" or "integrated" with the housing element.²¹⁰ These statements,
 9 according to Lepro, demonstrate that the '604 patent's claim 1 fastening means are meant to be
 10 integrated with the housing element and thus cannot encompass a number of the structures listed
 11 in column 5. Signify counters that the Federal Circuit has cautioned that relying on such
 12 statements might not always be appropriate in claim-construction analysis given the disparate
 13 procedural and legal requirements in foreign jurisdictions.²¹¹

14 What Signify doesn't appear to dispute is that these statements do concern a
 15 corresponding European patent²¹² and that they clearly (and repeatedly) distinguish it from prior
 16 art based on the fact that claim 1's fastening means are part of the housing element.²¹³ Instead,

17 ²⁰⁹ ECF No. 60 at 30–31.

18 ²¹⁰ ECF No. 60-4 at 2–6.

19 ²¹¹ See ECF No. 64 at 20–21. Signify also highlights that nothing in the statements made to the
 20 EPO directly limited the invention to the Figure 4 tabs. The issue is whether the statements
 21 indicated the invention was limited to integrated fastening means *like* the Figure 4 tabs, as this
 22 would necessarily undermine Signify's position that claim 1 should also cover various auxiliary
 23 fastening means that are not part of the housing element.

24 ²¹² See ECF No. 60-2; ECF No. 60-3.

25 ²¹³ E.g., ECF No. 60-4 at 2 ("Claim 1 is novel with respect to [prior art] . . . in that the housing
 26 element . . . includes fastening means for detachably coupling the housing element to the heat
 27 dissipation element."); *id.* at 2–3 (emphasis added) (distinguishing prior art as it was "obvious
 28 . . . that the cover itself includes no fastening means for detachably coupling the cover to a

1 Signify argues that Europe does not have § 112(f) and “has different laws of interpretation
 2 regarding means-plus-function terms,” so statements made to the EPO “should be given little
 3 weight.”²¹⁴ But Signify doesn’t explain why statements made during a patent’s prosecution
 4 about an invention’s design are rendered meaningless by the absence of a direct § 112(f)
 5 equivalent in European patent law.

6 While the Federal Circuit has cautioned “against indiscriminate reliance on the
 7 prosecution of corresponding foreign applications in claim construction analysis,”²¹⁵ it has not
 8 foreclosed consideration of (or even reliance on) such evidence when the statements “are
 9 relevant and not related to unique aspects of foreign patent law.”²¹⁶ In *Apple Inc. v. Motorola,*
 10 *Inc.*, for example, the Federal Circuit found that the district court did not err in relying upon
 11 statements that were made during a foreign prosecution to distinguish an invention from prior
 12 art.²¹⁷ Just as in *Apple Inc.*, the statements here were made during a foreign prosecution to
 13 distinguish the invention from prior art. And they are clear²¹⁸ and “consistent with the claims

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 15 heat[-]dissipation element.”); *id.* at 4 (emphasis added) (“**As the housing element includes**
 16 **fastening means** for detachably coupling the housing element to the heat[-]dissipation element,
 17 there is provided a secure connection between the housing element and the heat[-]dissipation
 18 element. The connection is also convenient, e.g. due to the fact that the fastening means **are**
 19 **included in the housing element**, and there is **no need of auxiliary fastening means.**”); *id.* at 6
 20 (distinguishing prior art because it “disclose[d] various attachment devices which would lead to
 21 (additional) devices applied . . . to try to solve the problem of providing a secure and convenient
 22 connection between the housing element and the heat[-]dissipation element” and noting that “[i]n
 23 contrast, **the integrated fastening means of the housing element in the present invention**
provides a convenient coupling arrangement”).

²¹⁴ ECF No. 64 at 21.

²¹⁵ *AIA Eng’g Ltd. v. Magotteaux Int’l S/A*, 657 F.3d 1264, 1279 (Fed. Cir. 2011).

²¹⁶ *Apple Inc.*, 757 F.3d at 1312.

²¹⁷ *Id.* at 1312.

²¹⁸ *Id.* at 1313 (citing *Gillette Co. v. Energizer Holdings, Inc.*, 405 F.3d 1367, 1374 (Fed. Cir. 2005)).

1 and the invention described in the specification.”²¹⁹ So while I need not rely on these statements
 2 in finding that there is no clear link between the column 5 structures and the claimed function
 3 because that is apparent from the face of the ’604 patent, they do buttress the intrinsic evidence
 4 that already supports this conclusion.

5 *iii. Signify’s claim-differentiation argument fails.*

6 Signify next argues that Lepro’s proposal is “barred by the principles of claim
 7 differentiation.”²²⁰ Under the “claim differentiation” doctrine, “each claim in a patent”
 8 presumptively “has a different scope.”²²¹ It thus “creates a presumption that [] dependent claim
 9 limitations are not included in the independent claim.”²²² But this “is not a hard and fast rule,
 10 and the presumption can be overcome by a contrary construction required by the specification or
 11 prosecution history.”²²³ And this “judicially developed guide to claim interpretation . . . cannot
 12 override” the statutory requirements of § 112(f).²²⁴

13 Signify contends that Lepro’s means-plus-function construction for “fastening means”
 14 would run afoul of the claim-differentiation doctrine because it would give claim 1 the same
 15 construction as claim 11. This would be the case, Signify contends, because the Figure 4 tabs
 16 require the housing element to be formed from a flexible material to allow coupling with heat-

17 ²¹⁹ *Id.* at 1313 (citing *AIA*, 657 F.3d at 1279). The foreign prosecution statements, for example,
 18 repeatedly note that the housing element “includes” fastening means, e.g. ECF No. 60-4 at 2,
 19 which the applicant interprets as being integrated with the housing element, *id.* at 6, and which is
 20 consistent with the use of the phrases “includes” and “comprises” in the ’604 patent. ’604
 Patent, 7:25–27, Cl. 1.

21 ²²⁰ ECF No. 54 at 39.

22 ²²¹ See *Comark Commc’ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1187 (Fed. Cir. 1998).

23 ²²² *GE Lighting*, 750 F.3d at 1310 (citing *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898,
 909 (Fed. Cir. 2004)).

24 ²²³ *Id.* (citing *Seachange Int’l v. C-COR, Inc.*, 413 F.3d 1361, 1369 (Fed. Cir. 2005)).

25 ²²⁴ *Laitram Corp. v. Rexnord, Inc.*, 939 F.2d 1533, 1538 (Fed. Cir. 1991).

1 dissipation element, and “claim 11 recites that the housing element is formed from a flexible
 2 material.”²²⁵ So limiting the claimed function to the structure of the Figure 4 tabs would
 3 “improperly render claim 11 superfluous.”²²⁶ Lepro counters that claim 1 would still be broader
 4 than claim 11 under Lepro’s proposed construction because it wouldn’t explicitly limit the
 5 housing element to being formed from flexible material, and therefore claim differentiation
 6 doesn’t apply.²²⁷

7 Preliminarily, a means-plus-function construction for claim 1 will include the Figure 4
 8 tabs *and* equivalents thereof,²²⁸ and Signify doesn’t address whether any equivalents would also
 9 necessarily require the flexible material described in dependent claim 11. So it is not entirely
 10 clear that these claims would share an identical scope, which is a prerequisite for application of
 11 the claim-differentiation doctrine.²²⁹ But even assuming that Signify is correct that construing
 12 the claimed function’s structure as the Figure 4 tabs would render claim 11 entirely superfluous,
 13 the Federal Circuit has long held that claim differentiation does not override application of
 14 § 112(f).²³⁰ So Signify’s claim-differentiation argument is “unavailing” because the structure
 15 depicted by the Figure 4 tabs is the only structure that is “specifically disclosed and tied to [the

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 17
 18²²⁵ ECF No. 54 at 39–40; ECF No. 64 at 22.

19²²⁶ *Id.* at 40.

20²²⁷ ECF No. 60 at 31–32.

21²²⁸ See *Laitram Corp.*, 939 F.2d at 1538 (citing *Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931, 934 (Fed. Cir. 1987)) (noting that an independent claim would literally be broader than a dependent claim with the same structure because the independent claim included structural equivalents under § 112(f), whereas the dependent claim did not).

22²²⁹ *Id.* (so long as the claims do not have “exactly the same scope . . . claim differentiation is maintained”). Claim 1’s “detachably coupling” function is also arguably broader than claim 11’s “releasably connecting” language.

23²³⁰ *Id.*

1 claimed] function in the specification,” and Signify “cannot rely on claim differentiation to
 2 broaden a means-plus-function limitation beyond” that structure.²³¹

3 In short, the only structure in the specification that is clearly linked with the “detachably
 4 coupling” function is that depicted by the Figure 4 tabs. Both intrinsic and extrinsic evidence
 5 runs counter to Signify’s position that the fastening means examples in column 5 correspond to
 6 this function, and Signify cannot use claim differentiation to broaden this means-plus-function
 7 limitation beyond its sole corresponding structure in the specification. So I construe the structure
 8 for the “detachably coupling the housing element to the heat[-]dissipation element” function to
 9 be that shown by tabs 450 of Figure 4 and described in written description at 7:42–51 and its
 10 structural equivalents.

11 **D. “Thermally connected/thermally coupled”**

Signify’s Proposed Construction	Lepro’s Proposed Construction	Court’s Construction
Plain and ordinary meaning (If construction required: “Transfer via thermal conduction, convection, or radiation.”)	“connected via thermal conduction, convection, or radiation; not thermally insulated”	Plain and ordinary meaning

16 The parties agree that the terms “thermally connected” and “thermally coupled” are
 17 synonymous in the context of the ’604 patent, but they disagree whether construction is required
 18 and, if it is, what that construction should be. Lepro proposes that I construe these terms to mean
 19 “connected via thermal conduction, convection, or radiation; not thermally insulated.”²³² Signify

22

 23²³¹ See *Saffran v. Johnson & Johnson*, 712 F.3d 549, 563 (Fed. Cir. 2013) (citing *Laitram Corp.*, 939 F.2d at 1538).

²³² ECF No. 60 at 33.

1 contends that these terms need no construction, and, alternatively, they should be construed to
 2 mean “transfer via thermal conduction, convection, or radiation.”²³³

3 The parties’ real dispute is over the “not thermally insulated” limitation that Lepro seeks
 4 to read into these terms. Lepro contends that a POSITA would not recognize a thermal
 5 connection or coupling if thermal insulation is present, but Lepro offers no evidence to support
 6 this statement.²³⁴ The only evidence Lepro cites as “intrinsic support” for adding this
 7 “clarification language” is that the patent teaches that the heat dissipation via thermal
 8 conduction, convection, or radiation is “passive.”²³⁵ This, according to Lepro, means that it
 9 “takes place *by itself* as a natural phenomenon in physics”—i.e., in the absence of thermal
 10 insulation.²³⁶ But Lepro then goes on to explain that thermal conduction, convection, or
 11 radiation between two things would still take place passively even if they were thermally
 12 insulated.²³⁷ So it is not clear how Lepro is reading in this limitation from the specification’s use
 13 of a term “passive” when it later acknowledges that that term applies both in the presence and
 14 absence of thermal insulation.

15 Imposing negative limitations must be justified by the “plain text of the claims” or the
 16 specification; otherwise, “departure from the claims’ ordinary meaning” is not warranted.²³⁸ So
 17 I reject Lepro’s request that I read between the lines of the specification to create a negative
 18 limitation that has no direct intrinsic support, and that I do so based solely upon Lepro’s own
 19

20 ²³³ ECF No. 54 at 41; ECF No. 64 at 23–24.

21 ²³⁴ ECF No. 60 at 33.

22 ²³⁵ *Id.*

23 ²³⁶ *Id.*

²³⁷ *Id.*

²³⁸ *Omega Eng’g, Inc, v. Raytek Corp.*, 334 F.3d 1314, 1333 (Fed. Cir. 2003).

1 ambiguous statements on natural physical phenomena and contentions about what a POSITA
 2 would understand these terms to mean.

3 The parties otherwise identify no real dispute over the scope of these terms that would
 4 require a construction. Lepro has not presented intrinsic or extrinsic evidence that these terms
 5 don't have a plain and ordinary meaning that would be understood by a POSITA,²³⁹ nor does it
 6 really even argue that this is the case.²⁴⁰ As these terms are used in the patents, the surrounding
 7 claim language and the specification will tell the jury everything it needs to know. And there is
 8 no evidence that the patentee gave these terms a special meaning. So I find that no construction
 9 is necessary for these terms.

10 E. **“Housing element including a transparent region”**

Signify's Proposed Construction	Lepro's Proposed Construction	Court's Construction
Plain and ordinary meaning (If construction required: “A housing part including a transparent region”)	“a single structure having a transparent region”	Plain and ordinary meaning

15 Lepro proposes that I construe the term “housing element including a transparent region”
 16 to mean “a single structure having a transparent region.”²⁴¹ Signify contends that this term needs
 17 no construction.²⁴² Lepro’s argument rests on its interpretation of the term “element,” which it
 18 contends “strongly suggests the recited structure is ‘element[ary]’ and thus is one physical piece”

20
 21

 22²³⁹ *Phillips*, 415 F.3d at 1312–13.

23²⁴⁰ While Lepro does assert that a POSITA would not recognize a thermal connection or
 24 coupling if thermal insulation is present, it does not contend that a POSITA wouldn’t recognize
 25 these terms as having an ordinary and customary meaning.

²⁴¹ ECF No. 60 at 34.

²⁴² ECF No. 54 at 43.

1 rather than something comprised of multiple pieces.²⁴³ But this already tenuous argument is
 2 undermined by intrinsic use of the term “element” in a different context to describe devices that
 3 are not single structures but rather are comprised of multiple pieces.²⁴⁴ The only other support
 4 Lepro provides for its construction is that the housing element is shown as a single structure in
 5 several embodiments in the specification.²⁴⁵ But the Federal Circuit has “repeatedly warned
 6 against confining claims to those embodiments,”²⁴⁶ and Lepro has offered no other evidence
 7 beyond its internally inconsistent interpretation of the word “element” that persuades me this is
 8 the rare case in which deviation from that general practice is warranted.²⁴⁷ Plus there is no
 9 evidence that the patentee gave this phrase a special meaning. So I find that no construction is
 10 necessary for this term.

11 IV. U.S. Patent No. 8,063,577

12 A. Overview

13 The ’577 patent discloses “[a] driver circuit for operating one or more light[-]emitting
 14 diodes (LEDs)”²⁴⁸ designed for “operating a LED with high efficiency.”²⁴⁹ LEDs need precise
 15 “voltage or preferably current control” to operate because they “exhibit large current variation in
 16 response to small voltage variation,”²⁵⁰ which would result in varying brightness of the LED.

17
 18 ²⁴³ ECF No. 60 at 34.

19
 20 ²⁴⁴ ’604 Patent, 3:45–65 (noting that the term “light-emitting element” can be used to define a
 number of structures, one of which is “a combination of the specific device that emits the
 radiation together with a housing or package within which the device or devices are placed”).

²⁴⁵ ECF No. 60 at 34.

²⁴⁶ *Philips*, 415 F.3d at 1323.

²⁴⁷ See *id.* at 1323–24.

²⁴⁸ ’577 Patent (abstract).

²⁴⁹ *Id.* at 1:42–43.

²⁵⁰ *Id.* at 1:11–13.

1 This control can be achieved by using a known “switched mode power supply” current-control
 2 system like a buck converter,²⁵¹ but such a system generally requires a “relatively large
 3 [electromagnetic interference] filter” and a “relatively large inductor” and is not optimized for
 4 efficiency or size,²⁵² a problem that the drive circuit of the ’577 patent is designed to rectify. The
 5 terms “connected in series” and “coupled in series” are used to describe relationships between
 6 subcomponents of the primary “driver circuit” described in the ’577 patent’s sole independent
 7 claim.²⁵³

8 **B. “Connected/coupled in series”**

9 Signify’s Proposed Construction	10 Lepro’s Proposed Construction	11 Court’s Construction
10 Plain and ordinary meaning	11 The “clear, simple definition” or “basic idea of a series circuit” as described by Dr. Zane at 34:4–38:15, and in the IEEE dictionary <i>i.e.</i> : the same current passes through each [connected/coupled] device in completing its path to the source of supply	12 Plain and ordinary meaning

13
 14 The parties agree that the terms “connected in series” and “coupled in series” mean the
 15 same thing and should share the same construction.²⁵⁴ Lepro proposes that these terms should be
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 17
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20 ²⁵¹ *Id.* at 1:18–20.

21 ²⁵² See *id.* at 1:36–43.

22 ²⁵³ *Id.* at Cl. 1 (describing a “set of input terminals,” a “transformer,” and a “resonant capacitor” with “a primary winding of the transformer and the resonant capacitor being coupled in series to the set of input terminals,” as well as “an output circuit” with a “set of output terminals” and “buffer circuitry” that “comprises an inductor connected in series with the set of output terminals”).

23
 24 ²⁵⁴ ECF No. 54 at 45 n.8; ECF No. 60 at 35.

1 construed as “the same current passes through each [connected/coupled] device in completing its
 2 path to the source of supply.”²⁵⁵ Signify argues that no construction of these terms is required.²⁵⁶

3 The dispute over these terms has shifted over time. Lepro apparently moved away from
 4 its initial proposed construction, which would have precluded the electrical current passing
 5 through various components from branching.²⁵⁷ Much of Signify’s initial argument about these
 6 terms focused on its objections to a construction that included this “without branching”
 7 limitation,²⁵⁸ as did the declaration of its expert, Dr. Regan Zane.²⁵⁹ Lepro has now said that it
 8 “largely agrees with the deposition testimony of Signify’s expert, Dr. Zane, about the meaning of
 9 the term[s].”²⁶⁰ And Lepro based its latest proposed construction on portions of Dr. Zane’s
 10 testimony and an Institute of Electrical and Electronics Engineers (IEEE) dictionary definition
 11 that it discussed with him during his deposition.²⁶¹

12 But Lepro took issue with Signify’s initial arguments that, according to Lepro,
 13 “incorrectly suggest that the meaning of ‘in series’ can encompass its opposite, ‘in parallel.’”²⁶²
 14 Much of its argument focused on this distinction, highlighting that the ’577 patent’s use of this
 15 term, Zane’s testimony, and the competing dictionary definitions the parties presented confirmed
 16 that “in series” does not encompass “in parallel.”²⁶³ But Signify then clarified that it is not
 17

18²⁵⁵ ECF No. 60 at 35.

19²⁵⁶ ECF No. 54 at 44.

20²⁵⁷ *Id.*

21²⁵⁸ ECF No. 54 at 44–49.

22²⁵⁹ ECF No. 54-16 at 10–15.

23²⁶⁰ ECF No. 60 at 35.

²⁶¹ *Id.*

²⁶² *Id.*

²⁶³ *Id.* at 35–38.

1 taking the position that “in series” encompasses “in parallel,” noting that the dictionary definition
 2 it cited is inconsistent with such a position and agreeing that “[c]urrent does not flow
 3 sequentially through parallel components,” which is “a feature of series components.”²⁶⁴ So
 4 despite the various arguments both parties have advanced, it appears they have reached a point
 5 where they have a similar understanding of what these terms mean. And the dictionary
 6 definitions both sides rely on are largely consistent.²⁶⁵

7 The final sticking point is a word in Lepro’s proposed IEEE-definition-based
 8 construction, which requires that current passing through each coupled/connected device be the
 9 “same.”²⁶⁶ Lepro highlights that Dr. Zane agreed that this was “a good description of a series
 10 circuit” and would be how he would teach it in introductory electronics.²⁶⁷ But Dr. Zane also
 11 clarified that this current would not be exactly the same (or identical) in more complex circuits,
 12 which Lepro doesn’t dispute.²⁶⁸ Despite this “caveat,” Lepro’s position, which it reiterated
 13 during the *Markman* hearing, is that this simplified definition should be adopted because it
 14 would be easier to explain to the jury and that any real-world complexities are factual-
 15 infringement questions that need not be addressed at this juncture.²⁶⁹

16 I find that these terms’ ordinary meaning governs for several reasons. The first is that Dr.
 17 Zane averred that these terms “are widely used and readily understood by those of ordinary skill
 18

20²⁶⁴ ECF No. 64 at 26.

21²⁶⁵ Compare ECF No. 54 at 45 with ECF No. 60 at 35.

22²⁶⁶ ECF No. 60 at 35.

23²⁶⁷ *Id.* at 36.

²⁶⁸ *Id.*

²⁶⁹ *Id.*

1 without further definition”²⁷⁰ and reiterated this opinion during his deposition.²⁷¹ This testimony
 2 stands unrebutted. Neither party has argued that the patentee gave this phrase a special meaning.
 3 And Lepro doesn’t appear to disagree with Dr. Zane about what these terms actually mean, but
 4 rather disagrees with him (and Signify) about whether this simplified construction is warranted
 5 or necessary²⁷² I therefore see no need to further construe these terms, and I find that they
 6 should be accorded their plain and ordinary meaning.

7 Lepro also argued (primarily during the *Markman* hearing) that I should adopt its
 8 concededly simplistic construction—despite it not explicitly encompassing the “caveat” Dr. Zane
 9 described and that Lepro agrees with—because it would be easier for the jury to understand. But
 10 Lepro’s proposal would not make things easier for a jury. The jury would first need to be told
 11 that the current that passes between devices that are connected/coupled in series is the “same.”
 12 But then the parties would need to explain that the word “same” doesn’t have its ordinary
 13 meaning in this context, and that the current doesn’t need to be exactly the same or identical for
 14 devices to be considered “in series.” Ultimately, it appears the parties or their experts will need
 15 to explain the nuances of these terms. But adopting Lepro’s proposed construction would add an
 16 additional step that, if anything, would only increase the risk of jury confusion.

17 Lepro’s final argument that “claims may not be construed by reference to the accused
 18 device” misses the mark. Dr. Zane’s testimony on this “caveat” was stated in general terms.²⁷³

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 20²⁷⁰ ECF No. 54-16 at 9.
 21²⁷¹ ECF No. 60-5 at 77:16–21.
 22²⁷² ECF No. 54 at 35.
 23²⁷³ ECF No. 60-5 at 49:2–16 (cleaned up) (“And as I mentioned more broadly, for more advanced circuit design, a skilled person would also understand how to apply that definition to this concept in a more complex circuit, but they would recognize—for example, you know, the word ‘same’ in that definition wouldn’t necessarily mean absolutely identical currents are flowing in each resistor But in that more general sense, it doesn’t have to be identical.”).

1 And Lepro does not dispute his opinion on this particular point—that the current would not be
 2 exactly the same or identical in “more advanced circuit design” generally.²⁷⁴ So this argument
 3 would be unavailing even if I was relying on Dr. Zane’s testimony to construe these terms rather
 4 than deferring to his unrebutted statements that they have a plain and ordinary meaning.

5 **V. U.S. Patent No. 9,709,253**

6 **A. Overview**

7 The ’253 patent concerns a recessed LED light fixture.²⁷⁵ “A recessed light fixture is a
 8 light fixture that is installed in a hollow opening in a ceiling or other surface,”²⁷⁶ and the ’253
 9 patent focuses particularly on a “downlight can fixture” like those often found in ceilings.²⁷⁷ The
 10 patent explains that recessed fixtures are traditionally configured to use “an incandescent lamp or
 11 a compact fluorescent lamp.”²⁷⁸ But these lamps are not as energy efficient as LEDs, and there
 12 are also environmental concerns related to disposal of compact fluorescent lamps because they
 13 include mercury.²⁷⁹ And, at the time of invention, LEDs did not “fit in existing incandescent
 14 lamp sockets and require[d] complex electrical and thermal management systems.”²⁸⁰ One
 15 aspect of the invention that relates to “thermal management” is a “heat sink” that is “thermally

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 19 ²⁷⁴ ECF No. 60 at 36.

20 ²⁷⁵ ’253 Patent, 1:38–40.

21 ²⁷⁶ *Id.* at 1:50–51.

22 ²⁷⁷ *Id.* at 1:38–40.

23 ²⁷⁸ *Id.* at 1:56–62.

24 ²⁷⁹ *Id.* at 1:62–2:3.

25 ²⁸⁰ See *id.* at 2:7–10.

1 coupled” to an “LED package” and “configured to transfer heat from the LEDs.”²⁸¹ The patent
 2 teaches that “[t]he heat sink can have any of a number of different configurations.”²⁸²

3 **B. *A heat sink comprising an upper surface and a lower surface***

4 Signify's Proposed Construction	5 Lepro's Proposed Construction	6 Court's Construction
Plain and ordinary meaning	“the heat sink having a surface at a top end and another surface at a bottom end”	Plain and ordinary meaning

7
 8 Lepro proposes that the phrase “a heat sink comprising an upper surface and a lower
 9 surface” should be construed as “the heat sink having a surface at the top end and another surface
 10 at a bottom end.”²⁸³ Signify contends that the phrase needs no construction.

11 “In some cases, the ordinary meaning of claim language as understood by a person of
 12 skill in the art may be readily apparent even to lay judges, and claim construction in such cases
 13 involves little more than the application of the widely accepted meaning of commonly
 14 understood words.”²⁸⁴ This appears to be one of those cases. The only substantive difference
 15 between the claim language and Lepro’s proposed construction is that Lepro seeks to construe
 16 the term “upper” to be “at a top end,” and the term “lower” to be “at a bottom end.”²⁸⁵ But upper
 17 and lower are “commonly understood words” that neither I nor the jury would have difficulty

21 ²⁸¹ *Id.* at 2:31–32.

22 ²⁸² *Id.* at 2:32–33.

23 ²⁸³ ECF No. 60 at 38.

24 ²⁸⁴ *Phillips*, 415 F.3d at 1314 (citing *Brown v. 3M*, 265 F.3d 1349, 1352 (Fed. Cir. 2001)).

25 ²⁸⁵ ECF No. 60 at 38.

1 grasping the meaning of.²⁸⁶ And in plain English, these terms would not be understood as
 2 synonymous with “at a top end” and “at a bottom end.”

3 Lepro argues that “[a]study of the specification made it clear that the terms ‘upper
 4 surface’ and ‘lower surface’ refer to the surfaces at the top and bottom ends of the heat sinks.”²⁸⁷
 5 In support of this argument, it relies on Figure 8 from the ’253 patent—an exploded view of the
 6 LED module of Figure 3 that contains an “exemplary” heat sink labeled heat sink 310.²⁸⁸ Heat
 7 sink 310 comprises what appear to be two surfaces on opposing ends of the heat sink.²⁸⁹ The
 8 detailed description does describe one of them—310a—as the “bottom surface.”²⁹⁰ It also notes
 9 that heat sink 310 has a “top end” 310e, though 310e is never referred to as the “top surface” or a
 10 “surface at the top” of the heat sink.²⁹¹

11 The principal problem with Lepro’s approach here is that it is trying to “import
 12 limitations from the specification into the claims,” which is something that courts should
 13 generally avoid doing.²⁹² In *Phillips*, the Federal Circuit observed that, when viewing the
 14 specification in this context, it will often “become clear whether the patentee is setting out
 15 specific examples of the invention . . . or whether the patentee instead intends for the claims and
 16

17 ²⁸⁶ See *id.*; see also *Brown*, 265 F.3d at 1352 (agreeing with construction of a claim that was “the
 plain reading of the claim text” when the language did not involve “technical terms of art” and
 did “not require elaborate interpretation”).

18 ²⁸⁷ ECF No. 60 at 39.

19 ²⁸⁸ ’253 Patent, Fig. 8; 4:11–13.

20 ²⁸⁹ *Id.* at Fig. 8. I say “appear” only because Figure 8 doesn’t actually show the “top end” of heat
 sink 310, though Figure 9, which is an “elevational cross-sectional top view of exemplary heat
 sink 310,” does.

21 ²⁹⁰ *Id.* at 7:36–38.

22 ²⁹¹ *Id.* (emphasis deleted) (Fins 311 extend substantially perpendicular from the bottom surface
 23 310a, towards the top end 310e of the heat sink 310.”).

²⁹² *Phillips*, 415 F.3d at 1323.

1 embodiments in the specification to be strictly coextensive.”²⁹³ “The manner in which the
 2 patentee uses a term within the specification and claims usually will make the distinction
 3 apparent.”²⁹⁴ And while in some cases “it will be hard to determine whether a person of skill in
 4 the art would understand the embodiments to define the outer limits of the claim term or merely
 5 to be exemplary in nature,”²⁹⁵ this is not one of those cases. The specification makes it clear that
 6 Figure 8 and heat sink 310 are exemplary in nature,²⁹⁶ and the summary section notes that “[t]he
 7 heat sink can have any number of configurations.”²⁹⁷ While heat sink 310 is the only
 8 embodiment of a heat sink in the specification,²⁹⁸ other claims recite heat sinks with different
 9 configurations than heat sink 310,²⁹⁹ so this is clearly not the only way to fabricate a heat sink
 10 under the ’253 patent.

11 Lepro also posits that its “proposal implicitly requires that the claimed heat sink have
 12 some thickness to allow for both an upper surface and a lower surface” such that sheet metal
 13

14

15 ²⁹³ *Id.* (citing *SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1341
 (Fed. Cir. 2001)).

16 ²⁹⁴ *Id.* (citing *Snow v. Lake Shore & M.S. Ry. Co.*, 121 U.S. 617, 630 (1887)).

17 ²⁹⁵ *Id.*

18 ²⁹⁶ ’253 Patent, 4:11–13 (emphasis deleted) (“FIG. 8 is a perspective exploded side view of the
 LED module of FIG. 3, in accordance with certain exemplary embodiments.”); *id.* at 7:21–23
 (“FIG. 9 is an elevational cross-sectional top view of the exemplary heat sink 310. FIG. 10
 illustrates a thermal scan of the exemplary heat sink 310 in operation.”).

19 ²⁹⁷ *Id.* at 2:32–33.

20 ²⁹⁸ In certain exemplary embodiments, a reflector housing 320 is configured to act as a secondary
 21 heat sink, e.g., *id.* at Fig. 11, 8:45–51, but heat sink 310 is the only exemplary embodiment of a
 22 heat sink that performs that function primarily.

23 ²⁹⁹ E.g., *id.* at Cl. 1 (emphasis deleted) (“[A] heat sink, wherein the heat sink includes an inner
 surface”); *id.* at Cl. 6 (“The downlight module of claim 1, wherein the heat sink comprises a
 first heat sink and a second heat sink, an inner surface of the second heat sink surrounding at
 least a portion of a reflector.”).

would be excluded “even though it can dissipate heat.”³⁰⁰ Heat sink 310 does have “some thickness.”³⁰¹ But Lepro’s proposed construction doesn’t imply any thickness greater than the plain claim language or require these surfaces to be a certain size. It would merely fix the locations of the claimed upper and lower surfaces to the top and bottom ends of the heat sink. One could, for example, create a sheet-metal heat sink in which the sheet metal extends either towards or away from an inner channel at the top and bottom ends to create “surfaces” similar to bottom surface 320ca of reflector housing 320.³⁰² This heat sink would be quite thin generally but would surely still fall within the plain meaning of Lepro’s proposed construction. And that assumes that the surface area of the edges of this hypothetical sheet-metal heat sink would not be sufficient to constitute a “surface” within the meaning of the ’253 patent without extending at the top and bottom ends, which is an issue that Lepro glosses over in its briefing.³⁰³ So even if I were to adopt Lepro’s proposed construction, it would not include a vague implied-thickness requirement without further intrinsic evidence and argument to support it.

The jury and I are familiar with what the words in the phrase “a heat sink comprising an upper surface and a lower surface” mean. And there is no evidence that the patentee gave this phrase a special meaning. So I find that no construction is necessary for this phrase.

³⁰⁰ ECF No. 60 at 39.

³⁰¹ See ’253 Patent, Fig. 8.

³⁰² Reflector housing 320 is much “thinner” than heat sink 310 and contains surfaces that are far smaller, but it could be configured to operate as a secondary heat sink. See ’253 Patent, 8:45–51.

³⁰³ While the location of the upper and lower surfaces doesn’t necessarily imply any particular level of thickness, a certain amount of surface area may need to present for something to be actually considered, or properly function as, a “surface.” And this, in turn, might involve some level of “thickness” in certain instances. But as the sheet-metal example demonstrates, surface area doesn’t necessarily correlate to overall thickness of a heat sink. And regardless, Lepro has not explained how the ’253 patent explicitly or implicitly requires the heat sink to have a minimum overall thickness or have surfaces with a minimum amount of surface area in order for it to function as intended in all cases/outside of certain exemplary embodiments.

1 **VI. U.S. Patent No. RE49,320**

2 **A. Overview**

3 The '320 patent involves an LED lighting device with a built-in Radio Frequency (RF)
4 antenna that allows a device to communicate with other devices and be operated via a remote
5 control.³⁰⁴ But an LED lighting device's components are "made from electrically conductive
6 materials . . . that could . . . significantly influence the RF communication with remote controls
7 or other lamps."³⁰⁵ So the patent discloses a device in which such materials are located
8 sufficiently below the antenna so they don't interfere with its RF signals.³⁰⁶ The antenna is also
9 placed "in a portion of the external housing" of the lighting device (or "outer enclosure") made
10 from "non-shielding material that does not disturb RF waves in reaching the antenna."³⁰⁷ One
11 aspect of the invention is a "heat sink" that "may form part of the outer enclosure."³⁰⁸ The '320
12 patent also teaches that the LED "light source" is "arranged to generate light along an optical
13 axis."³⁰⁹

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20 ³⁰⁴ See '320 Patent, 1:25–62.

21 ³⁰⁵ *Id.* at 1:40–46.

22 ³⁰⁶ *Id.* at 2:51–3:6.

23 ³⁰⁷ *Id.* at 1:59–63.

24 ³⁰⁸ *Id.* at 3:1–5.

25 ³⁰⁹ *Id.* at 2:7–8.

1 **B. “Configured for generating light along an optical axis”**

2 Signify’s Proposed Construction	3 Lepro’s Proposed Construction	4 Court’s Construction
5 Plain and ordinary meaning	6 “the beams from one or more 7 light-emitting diodes are set 8 up to be parallel to a single 9 optical axis”	10 Plain and ordinary meaning

11 Lepro proposes that the phrase “configured for generating light along an optical axis” be
 12 construed as “the beams from one or more light-emitting diodes are set up to be parallel to a
 13 single optical axis.”³¹⁰ Signify argues that no construction is required.³¹¹

14 Lepro argues that (1) the “an optical axis” claim language limits the invention to a single
 15 optical axis, and (2) generating light along a single optical axis “would necessarily require
 16 configuring LED beams to be parallel to that optical axis.”³¹² Much of its briefing is focused on
 17 explaining why a single optical axis is required. But construction is not necessary to clarify that
 18 point; use of the word “an” in the claim language is enough. And Signify agrees that the claim
 19 requires the light-emitting device to have a single optical axis.³¹³

20 So the only real dispute here is whether LEDs generating light “along” an optical axis
 21 must necessarily only emit beams that are parallel to that axis. In support of its position that
 22 parallelism is required, Lepro relies solely on a general dictionary that defines “along” as “on a
 23 line or course parallel and close to.”³¹⁴ But even if I were to endorse this particular definition,
 24 Lepro fails to explain the basis of its position that *all* emitted light beams must run parallel to the

25
 26 ³¹⁰ ECF No. 60 at 41.

27
 28 ³¹¹ ECF No. 54 at 53.

29
 30 ³¹² ECF No. 60 at 41–42.

31
 32 ³¹³ ECF No. 64 at 29.

33
 34 ³¹⁴ ECF No. 60 at 42 (citing American Heritage College Dictionary (2002)).

1 optical axis. The plain language of the claim requires that the LEDs be principally configured to
 2 generate light in that direction, but there is no limiting language in the claim or the specification
 3 that states the LEDs can “only” or “exclusively” emit light beams along or parallel to the optical
 4 axis.

5 Signify explained during the *Markman* hearing that LEDs do not generally emit
 6 completely parallel beams in the absence of some additional structure acting upon the light, such
 7 as a collimator like the one described in dependent claim 16 or depicted Figures 2–4. In the
 8 absence of such a device, LEDs configured to generate light along an optical axis would
 9 generally emit light both along the optical axis and necessarily outward from the bulb as well.
 10 And this is consistent with Figure 1, which shows an LED “that generates light along an optical
 11 axis” but has a three-sided upper enclosure through which the “the light escapes.”³¹⁵ Lepro, both
 12 in its briefing and during oral argument, repeatedly stated that it was not trying to require use of
 13 a collimator to achieve parallel beams,³¹⁶ possibly to avoid claim differentiation issues.³¹⁷ But it
 14 didn’t directly dispute Signify’s point that LEDs don’t generally emit parallel beams, nor did it
 15 ever explain how LEDs can be “set up” to emit parallel beams in the absence of some additional
 16 structure like a collimator acting upon the light.

17 Lepro’s argument that the claim language requires LED beams to be set up to generate
 18 only parallel beams is therefore unpersuasive. The jury and I are familiar with what the words in
 19 the phrase “configured for generating light along an optical axis” mean, and there is no evidence
 20

21 ³¹⁵ '320 Patent, Fig. 1.

22 ³¹⁶ See ECF No. 60 at 41 (describing Signify’s argument that Lepro’s proposed construction
 would require a collimator as a “false assertion”).

23 ³¹⁷ The doctrine of claim differentiation “creates a presumption that [] dependent claim
 limitations are not included in the independent claim.” *GE Lighting*, 750 F.3d at 1310 (citing
Seachange Int’l, 413 F.3d at 1369).

1 that the patentee gave this phrase a special meaning. So I find that no construction is necessary
2 for this phrase.

C. "The heat sink forming at least a portion of an outer enclosure"

Signify's Proposed Construction	Lepro's Proposed Construction	Court's Construction
Plain and ordinary meaning	"at least a segment of an outer enclosure is formed by a heat sink such that the heat sink is exposed to the outside"	Plain and ordinary meaning

8 Lepro proposes that the phrase “the heat sink forming at least a portion of an outer
9 enclosure” be construed to mean “at least a segment of an outer enclosure is formed by the heat
10 sink such that the heat sink is exposed to the outside.”³¹⁸ Signify argues this phrase should be
11 accorded its plain and ordinary meaning.³¹⁹

12 Lepro advances several arguments in support of reading its proposed “exposed to the
13 outside” limitation into the claim language, but none of them are persuasive.³²⁰ It again
14 highlights that “all of the embodiments depicted in the patent figures consistently show [that] the
15 heat sinks form a ‘part’ of the outer enclosure exposed to the outside.”³²¹ But this, of course, is
16 not enough, as the Federal Circuit has “repeatedly warned against confining claims to those
17 embodiments” in the specification.³²²

³¹⁸ ECF No. 60 at 43.

²⁰ ³¹⁹ ECF No. 54 at 56–57.

²¹ Lepro also proposes using the term “segment” instead of “portion” to resolve potential
ambiguity over whether the heat sink needs to be “exposed to the outside.” ECF No. 60 at 44–
²² 45. But this argument is rendered moot by my rejection of Lepro’s construction of this phrase
and conclusion that claim does not limit the heat sink to being exposed to the outside.

²³ ³²¹ ECF No. 60 at 43.

³²² Philips, 415 F.3d at 1323.

1 Lepro also attempts to extrapolate this limitation from other language in the patent. It
 2 first notes that “the term ‘outer’ is readily understood to mean ‘located on the outside,
 3 external.’”³²³ But the word “outer” clearly modifies the “enclosure” that the heat sink forms a
 4 portion of, not the heat sink itself. Lepro then contends that its proposed construction is
 5 “consistent with the stated objective of the ’320 Patent to provide ‘a very effective heat sink.’”³²⁴
 6 But Lepro doesn’t point to any intrinsic or extrinsic evidence that explicitly states or even
 7 suggests that “exposure to the outside” is the only way to achieve “a very effective heat sink,”
 8 which is itself a somewhat ambiguous term. And statements in the specification that follow this
 9 phrase tend to suggest that the heat sink’s electrical resistivity—which is determined by what the
 10 heat sink is made of—plays a (if not the) critical role in making the heat sink “very effective” as
 11 this term is meant in this specific context.³²⁵

12 Finally, the two cases Lepro relies on are materially distinguishable. In *Medicines Co. v.*
 13 *Mylan, Inc.*, the Federal Circuit relied on an embodiment to construe the term “efficiently
 14 mixing,” which was a particular claimed process.³²⁶ It did so because this embodiment was “the
 15 only *description* of efficient mixing . . . that cast[] light on what efficient mixing” actually was
 16 and that would “enable[] one of ordinary skill in the art to achieve the objects of the claimed
 17 invention.”³²⁷ But there is no need to turn to embodiments in the ’320 patent to understand what

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 19 ³²³ ECF No. 60 at 43.
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³²⁴ *Id.* at 44.

21 ³²⁵ Compare ’320 Patent, 2:2–4 (noting that because of the lighting device’s very small size “a
 22 very effective heat sink is needed to remove the unavoidable heat dissipation in the light source”) *with id.* at 2:36–39 (“Having a heat sink with an electrical resistivity of less than 0.01Ωm serves
 23 to provide a heat sink with substantial thermal conductivity, thus allowing the lighting device to
 be miniature sized.”).

³²⁶ *Medicines Co.*, 853 F.3d at 1307.

³²⁷ *Id.* at 1309; *see also id.* (quoting *Retractable Techs., Inc. v. Becton, Dickinson & Co.*, 653
 F.3d 1296, 1305 (Fed. Cir. 2011) (“Accordingly, construing ‘efficiently mixing’ to incorporate

1 a heat sink, as a structure, actually is. And Lepro has not demonstrated that limiting the way the
 2 heat sink is arranged in relation to an outer enclosure is necessary for a POSITA to create this
 3 invention so that it functions as intended.³²⁸ Lepro also relies *Nystrom v. TREX Co.*, in which
 4 the court rejected the plaintiff's efforts to "broaden the term 'board' to encompass relatively
 5 obscure definitions that we[re] not supported by the written description or prosecution
 6 history."³²⁹ But in *Nystrom* "[t]he written description and prosecution history consistently use[d]
 7 the term 'board' to refer to wood decking materials from a log."³³⁰ Lepro only highlights that
 8 several embodiments show the heat sink exposed to the outside, a far cry from the pervasive use
 9 in multiple contexts detailed in *Nystrom*.³³¹

10 In short, the arguments and cases Lepro cites in support of its proposed construction are
 11 all unconvincing. As the phrase "the heat sink forming at least a portion of an outer enclosure"
 12 is used in the patent, the surrounding claim language will tell the jury everything it needs to
 13 know. And there is no evidence that the patentee gave the phrase a special meaning. So no
 14 construction is necessary for this phrase.

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 19 the efficient mixing conditions of Example 5 is necessary to 'tether the claims to what the
 specification[] indicate[s] the inventor actually invented.'").

20 ³²⁸ It was also critical to the *Medicines* court's analysis that the patentee had relied on that
 embodiment "to overcome prior art cited during prosecution and did not cite any other examples
 of efficient mixing." 853 F.3d at 1308. But Lepro hasn't provided evidence that the patentee
 here relied on the '320 patent's embodiments showing that the heat sink is "exposed to the
 outside" to distinguish prior art.

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 22 ³²⁹ *Nystrom v. TREX Co.*, 424 F.3d 1136, 1145 (Fed. Cir. 2005).

23 ³³⁰ *Id.* at 1145.

³³¹ See *id.* at 1143–45.

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2 **Claim-Construction Chart**
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Term	Signify's Proposed Construction	Lepro's Proposed Construction	Court's Construction
<i>Background noise</i>	Plain and ordinary meaning (If construction required: "electromagnetic radiation produced independent of the lighting fixture")	Indefinite	"electromagnetic radiation produced independent of the lighting fixture"
<i>Controller</i>	Plain and ordinary meaning; (If construction required: "A circuit or component that controls")	Means-plus-function term	Plain and ordinary meaning
<i>Adjustment circuit</i>	Plain and ordinary meaning (If construction required: "A circuit that adjusts")	Means-plus-function term	Plain and ordinary meaning
<i>Power circuitry</i>	Plain and ordinary meaning (If construction required: "Components of a circuit that provides power")	Means-plus-function term	Plain and ordinary meaning
<i>Light-emitting module</i>	Term appears in preamble, no construction required (If construction required: "A self-contained assembly of electronic components and circuitry for emitting light")	Preamble is limiting. "A packaged light emitting device designed for use with other light emitting devices"	Preamble is not limiting
<i>Fastening means</i>	Function: detachably coupling the housing element to the heat-dissipation element. Structure: fastening means as described at 5:18–24, 6:18–24, 7:25–26., 7:42–51, 7:55–67 and/or identified by reference numeral 450 in Figure 4 and equivalents thereof.	Function: releasably connecting the housing element to the heat-dissipation element. Structure: The tabs 450 shown in Figure 4 and described in col. 7:42–51 and their structural equivalents.	Function: detachably coupling the housing element to the heat-dissipation element. Structure: The tabs 450 shown in Figure 4 and described at 7:42–51 and their structural equivalents.
<i>Thermally connected/ thermally coupled</i>	Plain and ordinary meaning (If construction required: "Transfer via	"connected via thermal conduction, convection, or	Plain and ordinary meaning

Term	Signify's Proposed Construction	Lepro's Proposed Construction	Court's Construction
	thermal conduction, convection, or radiation.”)	radiation; not thermally insulated”	
<i>Housing element including a transparent region</i>	Plain and ordinary meaning (If construction required: “A housing part including a transparent region”)	“a single structure having a transparent region”	Plain and ordinary meaning
<i>Connected/ coupled in series</i>	Plain and ordinary meaning	The “clear, simple definition” or “basic idea of a series circuit” as described by Dr. Zane at 34:4–38:15, and in the IEEE dictionary <i>i.e.</i> : the same current passes through each [connected/coupled] device in completing its path to the source of supply	Plain and ordinary meaning
<i>A heat sink comprising a upper surface and a lower surface</i>	Plain and ordinary meaning	“the heat sink having a surface at a top end and another surface at a bottom end”	Plain and ordinary meaning
<i>Configured for generating light along an optical axis</i>	Plain and ordinary meaning	“the beams from one or more light-emitting diodes are set up to be parallel to a single optical axis”	Plain and ordinary meaning
<i>The heat sink forming at least a portion of an outer enclosure</i>	Plain and ordinary meaning	“at least a segment of an outer enclosure is formed by a heat sink such that the heat sink is exposed to the outside”	Plain and ordinary meaning

Conclusion

IT IS THEREFORE ORDERED that I adopt the above constructions.

IT IS FURTHER ORDERED that this case is referred to the magistrate judge for the

4 mandatory settlement conference required by Local Patent Rule 1-19(a).

U.S. District Judge Jennifer A. Dorsey
December 4, 2023